The Practical Teacher

A MONTHLY EDUCATIONAL JOURNAL.

Edited by JOSEPH HUGHES.

'*Knowledge is proud that he has learned so much,*
Wisdom is humble that he knows no more.'—COWPER.

VOL. XIII. No. 2. AUGUST, 1892. { PRICE, 6D. / POST FREE, 8D.

TACT
IN THE BUSINESS OF SCHOOL-KEEPING.

BY RICHARD BALCHIN.

HAVING now fully described certain typical characters among the boys we meet, and also indicated the method by which they should be managed, we will pass on to the next division of our subject, and point out the prominent personalities among the parents who periodically honour us with their visits. In our largest schools the teacher is, of course, quite unacquainted with the majority of the parents. He would indeed be only too pleased to see many of these unknown ones, and dispense with the visits of those with whose presence and tongue he is already too familiar.

A great part of the popularity of a school depends upon the tact shown by the master in his interviews with parents. A furious mother, her bosom heaving with the turmoil of passion, comes in like a lion, but, under tactical management, she goes out like a lamb. And for the remainder of the day, she, being a garrulous creature, has a fertile topic of discourse 'all down her street :—'The schoolmaster is *such* a gentleman ; she always *could* do with him.'

Let us consider somewhat in detail the tact to be displayed in the management of parents, and we will begin with type number one :—

The Boisterous, Ill-tempered Mother.

This has always appeared to me a most interesting character to deal with. It is what the doctors would call 'a good case.' There is great scope for experimental operation ; and it is quite delightful, from a scientific point of view, to note the gradual unfolding of results under skilful treatment. There stands our subject. She has just banged open the door of the school. The terrible display of her rage is awful to see. Let her 'go on.' Stand still and calmly contemplate this fearful storm ! Watch for a few moments the waves of passion and listen to the roar of the tempest. You feel that you have but to speak the words, 'Peace, be still,' and there will be 'a great calm.' At last, having opposed your patience to her fury, the following dialogue becomes possible :—

Master.—This seems a very serious case.

Parent.—Yes, indeed. A *very* serious case. Why the poor child's black and blue all over.

M.—When did this happen ?

P.—Last night. The teacher's knocked him about shamefully. If I could only get at him, I'd let him know !

M.—Does the father know about it ?

P.—No. I'm afraid to tell him. Bless you ! He'd come down and make a fine row ! He's sich a 'ot-tempered man ; not like me.

M.—Then we had better not tell him. You and I can manage the business and put matters right. You stay here, and I will go and speak to the teacher. Jones, will you bring this lady a chair ?

The master speaks to the teacher, who comes out of his room with the boy and confronts the mother. Exchange of significant glances ; but upon a wafture of the master's hand towards the mother, with all the solemn, suave manner of an exalted ecclesiastic giving his 'benedictus,' a fresh outbréak of pent-up passion is prevented.

M. (to the boy).—What did your teacher hit you with ?

B.—His hand.

P.—You little liar ! You told me a stick.

B.—No I didn't, mother. I said a boy hit me with a stick.

(Another wafture of the hand by the master.)

M.—Why did Mr. D. strike you with his hand ?

B.—He was pulling me out, and knocked me against the desks.

M.—Then he did not really hit you with his fist, you struck against the desk ?

B.—Yes, sir.

P.—Oh ! you wicked boy ! What did you tell me last night ?

(Another wafture.)

M.—Why did Mr. D. bring you out ?

B.—Because the boy behind me, Tozer, hit me with his ruler, and I hit him back.

BRITISH MUSEUM

M.—Did Tozer do anything else to you?

B.—Yes, sir. When we got out, he began fighting me.

M.—You both had a fight. Who got the worst of it?

B.—He was getting the worst; but then one of his pals comes up and hit me about with a stick and made bruises all down my side.

P.—You little wretch! Kim 'ere!

The enraged parent clutches at her offspring, and is about to administer c.p., when the master interposes.

Finally, the teacher and boy retire to their room. The mother's ruffled spirits are allayed; and with many apologies for taking up so much of the master's time, she good-naturedly wishes him good morning and departs.

'The Dissipated, Drunken Father.'

This is one of the saddest sights in our school experience. The home is wretched and loathsome, morally and materially. But it is the place where a group of children are being trained (?) If one of these little ones should, as by a miracle, grow up straight, he is a character to be greatly admired, and will certainly become a power for good. But it is pitiable to think how heavily such a one is handicapped for life's race.

Can the schoolmaster do anything for the miserable creature who now stands before him jabbering senselessly? Hs has come to know whether his boy plays truant. Well, he does not. Then the father *will* have the boy out; he wants to speak to him. It now appears that the man wishes his son to hand him the threepence the mother gave him to bring home the dinner-loaf with. But the mother gave him no threepence.

'You young liar!' yells the drunkard; who is now about to act the brute to his unfortunate child; when the master sends the boy to his class and tries to get at the better side of the parent, through the faint fatherly instinct which is, even now, not entirely smothered up in the fumes of alcohol.

Master (kindly).—Mr. Jones, why were you going to strike your little boy just now?

Father.—Because he told me a lie, that's why.

M.—Well, that's strange. Why, I would trust that boy with a five-pound note! Are you quite sure he *had* the money? You will excuse my speaking plainly to you. The little fellow is one of the brightest and best-behaved in his class. You ought to be proud of him. I should, if he were my boy.

F.—I *am* proud of him, there's no mistake about that, and so is his mother. We're all proud of him, as far as that goes.

M.—Well, I should be very sorry to know that he told you, his father, a lie; because I should have to change my opinion of him altogether. Will you ask his mother whether she *did* give him the money?

F.—Yes, I will. Perhaps she didn't. I'll come and let you know. I don't want the child to get a bad character when he don't deserve it, you know.

M.—Have you ever heard Tommy read? He is a good reader.

F.—No. Can't say as I have. Didn't know he *could* read. I can't.

M.—Well, he *can* read. Will you let him read to you to-night or to-morrow night, if I let him bring home a book from our library?

F.—All right, I will.

M.—Good morning.

F. (shaking hands).—Good morning. You'll be kind to the little chap, won't you? (And there was a tear in that father's eye.)

Quite recently, it came to my notice that a boy named U——l weaned his father from the beer-shop by reading a little every night from 'Little Dorrit,' though that father had a short time before brutally thrashed his boy for joining a Band of Hope.

COMMON-SENSE LESSONS IN EVERY DAY HOUSEWORK.

BY MRS. E. A. SHARMAN,

Lecturer to the National Health Society,
Author of 'Family Cookery.'

To Renovate Carpets, Upholstery, Clean Pictures, etc.

Carpet-cleaning.—There are several soaps advertised at the present time for cleaning carpets, some of which when tried are found to leave a 'washed-out' appearance upon the carpet when dry, and the colours more or less faded. Nothing is really better to use than the old-fashioned bullock's gall, to be obtained from the butcher. It is not pleasant to use, but cleans the carpet so well, that when finished and laid down one feels repaid for the inconvenience. Girls, however, often object so much to the smell that they cannot be induced to try the wash; in that case one of the patent soaps must be used. Gall-wash is prepared by mixing together a bucketful of soft soapy water, and half a pint of bullock's gall. When all dust has been shaken and swept from the carpet, it should be laid quite *flat* upon a clean floor, or creases will show as lines when dry. A clean paved backyard can be used, and the air will carry the smell away. Take a piece of house flannel, and a soft scrubbing brush having rather long bristles. Dip the flannel into the water, and proceed to wash a portion of the carpet after the manner of washing a floor. Dip the brush into the bucket, rub a little soap upon it, and scrub the wetted part well, washing the soap and dirt off with the flannel until the surface looks clean and the colours bright. Wipe it as dry as possible before wetting another portion. Great care must be taken to scrub evenly, not putting more pressure on one part than another, or the carpet will dry having a patched appearance. Dry quickly, and upon grass when possible; otherwise, stretched upon a clean, dry floor, a fire being lit to hasten the drying. If the carpet is dried upon grass and in the sun, place it face downwards, or the colours will fade. This method of cleaning produces the best results, the colours being restored to their original brightness, the carpet looking like a new one. If carpets are daily swept with a very coarse bannister brush, the top threads will soon become worn, the pattern disappearing, and, in the case

of a soft carpet, will soon break into holes where the most pressure lies. The use of a cane brush once a week is quite enough ; a soft brush should be used all other days. If carpets are only swept *once* a week, they become so full of dust that it is really necessary to use a cane brush always to clean them. If carpets are to wear well, and look nice to the end, they must be taken proper care of, or no amount of trying to renovate them at the spring cleaning will be of much use, as they will only look fresh for a week or two. Grease spots can be taken out by using a preparation of equal parts of Fuller's earth and magnesia mixed to a paste with boiling water, and laid hot upon the spots. Let the mixture remain until dry, then brush off. If turpentine is used to take out the grease spots, it is often found to leave a stain behind.

To Renovate Upholstery.—Girls who delight in putting a finish upon everything they do, often show great taste also in making home look pretty. They develop a taste and knack for upholstery, which many grown women never attain. It is much easier to do upholstery than dressmaking, and is quick and pleasant work, and good preparation for girls who wish to become dressmakers. Upholstery requires thought and careful calculation, with a little knowledge of drawing, which all school-girls learn nowadays. To be a home upholsterer, a girl must not only be able to make up pretty cretonnes, dimities, and muslins, but she must also know how to renovate old ones in the way of washing, ironing, and refixing them. In choosing a cretonne, let it be reversible if possible, and one which will not pull. When making up, cut the pattern carefully, and take great pains with seams and hems, turning plenty of margin in and tacking the edges round. An upholsterer's needle and some strong thread will be required to catch down depressions for holding buttons, when doing sofas, chairs, quilts, mattresses. When fitting cretonnes and woollen fabrics on such articles of furniture, fasten the buttons of depressions down first by threading them through once, passing the needle through the stuffing, and tying off firmly at the bottom, underneath the article. Pay particular attention to fastening off buttons, leave a strong piece of thread ; if cut too short the buttons come undone. Cut the material to the shape of the chair, etc., after the depressions are done, and either tack or sew the material upon the stuffing, finishing off by tacking a narrow fancy braid round the edge of the fabric. It is not the fashion now to cover up dressing-tables, chairs, and boxes as formerly, but the practice is to be recommended in a cottage home, where cleanliness, light, and colour have to make up so much for want of space, and the dullness of town houses closely surrounded by other dwellings.

To Wash Art Muslins.—Reds, yellows, and terra-cottas wash fairly well by the following method :—Cut up finely some Sunlight soap, put it into a sauce-pan with enough cold water to cover it well, and melt it slowly to a jelly. Make a hot soapy lather of this, and cool it lukewarm by adding cold water to it. Put the water into two pans, one to be used for washing, another for rinsing with ; then put into a third pan some clean salted water, or vinegar and water. Add two good handfuls of bran each to the washing and rinsing waters, which prevents the colours from running ; wash quickly ; then rinse in the salted water ; do not wring the article, as that causes it to pull, but squeeze the water out, shake well to get rid of the bran, roll in a towel to squeeze out more water, or dry immediately out of doors if the day is breezy and fine. Iron at once before quite dry, on the wrong side, then air off. Sometimes the muslin or cretonne requires starching a little ; if so, stiffen with thin *boiled* starch ; then roll tightly in a dry cloth, and mangle if possible, and iron at once. Muslins of one colour, if creased, hold near a fire, pulling out the contrary way to the creases ; or pass a warm iron over the back of the muslin. If cretonnes are very heavy and thick, wring them out in an old blanket, to absorb as much water as possible. Silk and worked antimacassars, or other goods, must be washed in lukewarm soapy water, and rinsed in cold water, to which a few drops of *sulphuric acid* have been added. Wrap in a clean cloth, and mangle and iron at once on the wrong side, taking care that the irons are not too hot. Table-cloths which have become dirty and faded are best dyed, and then trimmed with pretty ball fringe. Cloth and woollen materials can also be cleaned by washing with liquid ammonia. Desks, and chairs covered with leather or American cloth, can be renovated by rubbing a little vaseline over with a soft rag.

To Clean a Picture.—We will suppose that the picture about to be cleaned has glass in front of it, and may be one of the many Christmas pictures, or photograph, or an engraving, and enclosed in a gilt frame, or an ordinary wooden frame. If an Oxford frame, made of oak and varnished, it can be polished with furniture paste, according to the directions given for polishing furniture, after the picture has been taken out and carefully dusted. Then clean the glass, using ammonia water and a wash leather to rub with. Polish with an old silk handkerchief, and put the glass aside for a little while, then rub it again, to be quite sure that the glass is dry, as it would spoil the picture if in any way damp. When done lay the frame face downwards upon a cloth, so as not to scratch it. Lay the picture upon the glass perfectly straight and flat. Fasten the corners down with strong pins, and turn the picture over carefully to see if it is fixed right. Then turn it face downwards again, take out a pin and put a tack in its place, until all four corners are tacked down. Some pictures have a piece of very thin wood fastened at the back of them to hold all secure. Strong brown paper pasted over the back instead of the wood keeps all dust out. See that the rings for holding the cord are firm ; if the picture is a heavy one do not grudge a new cord every year for hanging it. See that the nails for hanging upon are driven firmly into the wall, with the head slanting upwards, or the picture may slip off the nail some day, when a door is closed with a bang. It is a matter of taste whether the picture is hung flat upon the wall or leaning forwards. If hanging forward, let it rest upon two nails, placed at each corner, for support. If the picture is not air-proof, damp and dust will settle within, causing black patches to be seen. These patches ought to be removed at the early stage of discolouration. If a picture is allowed to hang upon a damp wall, mildew will quickly cause it to rot and tear. Directions have been given for cleaning gilt picture frames. If framed photographs, and photographs taken upon glass, are so finished off when cleaned as to carefully exclude the air and damp, they will last for years or a lifetime without fading ; but if any traces of fading are perceived, it

will be better to take the picture to some trustworthy picture dealer who will set the mischief right, while if you let it continue to hang upon the wall in the same position perhaps in a few months it will have faded out of all knowledge. Pictures should be dusted weekly, and if fly or other marks are found upon the glass, breathe gently upon it, and rub with a silk handkerchief until they are removed.

(To be continued.)

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CONVERSATIONAL DRAWING LESSONS FOR INFANTS.

BY MRS. E. MORTIMER,

Author of Practical Kindergarten Lessons for English Infant Schools; Lecturer on the Kindergarten at the Home and Colonial Training College.

THE following patterns consist of combinations of vertical and horizontal lines, 1 to 5 squares long. These long lines require more power of hand; and, necessarily, by learning to draw them, the children acquire firmness. The lines must also be drawn very accurately or the patterns do not look nice.

CONVERSATIONAL LESSON ON PATTERN 10, THE UPPER HALF (XVI.)

The children must have drawing-books and nicely sharpened pencils. The teacher must be provided with a chequered blackboard.

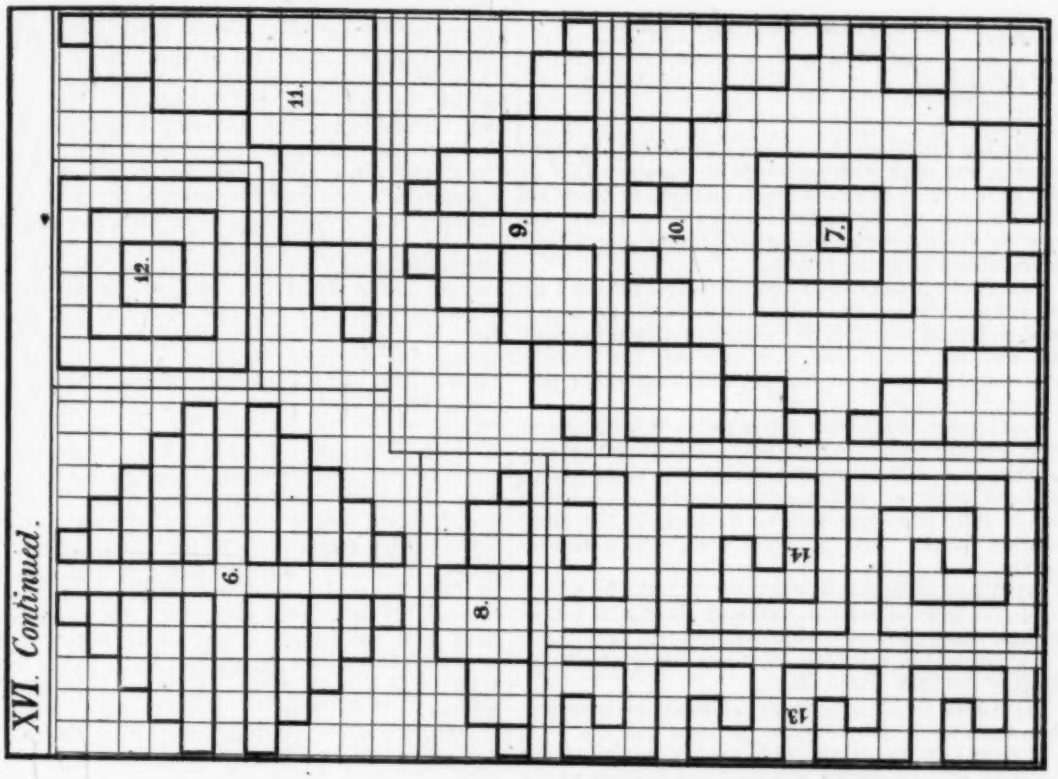
Now, children, look at the blackboard. Where have I put the chalk? On the corner of the top square. What have I done now? Drawn a line. What kind of line? Vertical. How long? Three squares. Where did I begin it? At the top. Now put your pencil on the top square, and count three squares down, and put a very little dot to show where you are to stop. Now draw the line. Yes, some of those lines are very nicely drawn. Look at the blackboard again. What have I done? Drawn another line. What kind of line? Horizontal. How long? Three squares. Where did I begin it? At the top of the vertical line. Yes, and drew towards the right. Now you draw one like it. I should like you to draw another horizontal, beginning at the bottom of the vertical line; and, now, another vertical line to join the two horizontal lines. What have we made? A square. How many horizontal lines? How many vertical lines? How long are all these lines? Three squares long.

Now watch me. What have I drawn? A vertical line. How long? Two squares. Where did I begin it? At the bottom end of the first vertical line. Yes, you draw one like it; but be very careful how you join it to the vertical line above it. You must not let the join be seen. Very well; now see what I have done. A horizontal line at the bottom of the vertical line. How long? Two squares. You draw one like that. And now you must draw another vertical line to join the end of the horizontal line to the one above it. What do you see now? Another square. How many horizontal lines did you draw? How did you get the top one? Yes, the line that is the bottom of the first square is the top line of this one. Did you use the whole of the line? Why not? Because the sides of the last square are only two squares long.

Now see what I am going to do. Well, Mary, tell me. You have drawn a vertical line, one square long. Very good. Where did I begin it? You joined it to the vertical line, two squares long, on the left side. Very well. You try to draw a line like that. About what must you be very careful? Yes, to join the lines nicely; the three vertical lines must be joined to look like one long line. Now draw a horizontal line one square from the bottom of that vertical line. What must we do to make that into a square? Yes, draw another vertical line on the right side. Tell me how many different sized squares you have drawn.

Now we are going to do something else. Look at the top square. How long are the sides? Put your pencils at the end of the horizontal line, and from there draw a horizontal line two squares long. About what must you be careful? That is right, you must not see the join. Look at the blackboard again. What have I done? Very well; now you can draw a vertical line down two squares from the end of the horizontal line. How can you make those lines into a square? By drawing another horizontal line to join the vertical lines; well, finish that square, and then join a horizontal line, one square long, on to the top horizontal, and then try to finish the square. That is very nicely done. Now we have drawn one half of our pattern. I think you will be able to do the other half more quickly. Watch me. What have I drawn? A square. Is it drawn close up against the last? No, a space is left. That is right, you must leave one space, then draw on the next. How long are the sides of the square? Take care that you join all the corners nicely. Now look at the blackboard again. What have I drawn? A square. How long are the sides? Two squares long. You may draw one like that, and now one with sides three squares long. Under that draw a square with sides two squares long, and under that one with sides one square long. That finishes our pattern. What can you say about the second half? Yes, it is like the first half, only turned round the other way. What does the whole pattern look like? Yes, it looks like an arch. Where do you see arches? Across roads; across rivers; for gateways. What is the use of arches? Sometimes they are bridges for people, horses, and carriages to go over; sometimes they are railway bridges. Very well. Which will you call yours? Tommy wants to call his a railway bridge; and Mary thinks hers is the bridge that she walked across, when she wanted to get the other side of the river. Very well, now you can all draw another bridge, and take care that the lines are all well joined, or there may seem to be cracks in your bridge. Do you like cracks in a bridge? Why not? We like bridges to be quite strong, so that if we go across them we should not have the least fear of falling. Very well, now make bridges over which people would not be afraid to go.

(To be continued.)


XVI. Continued.
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12.
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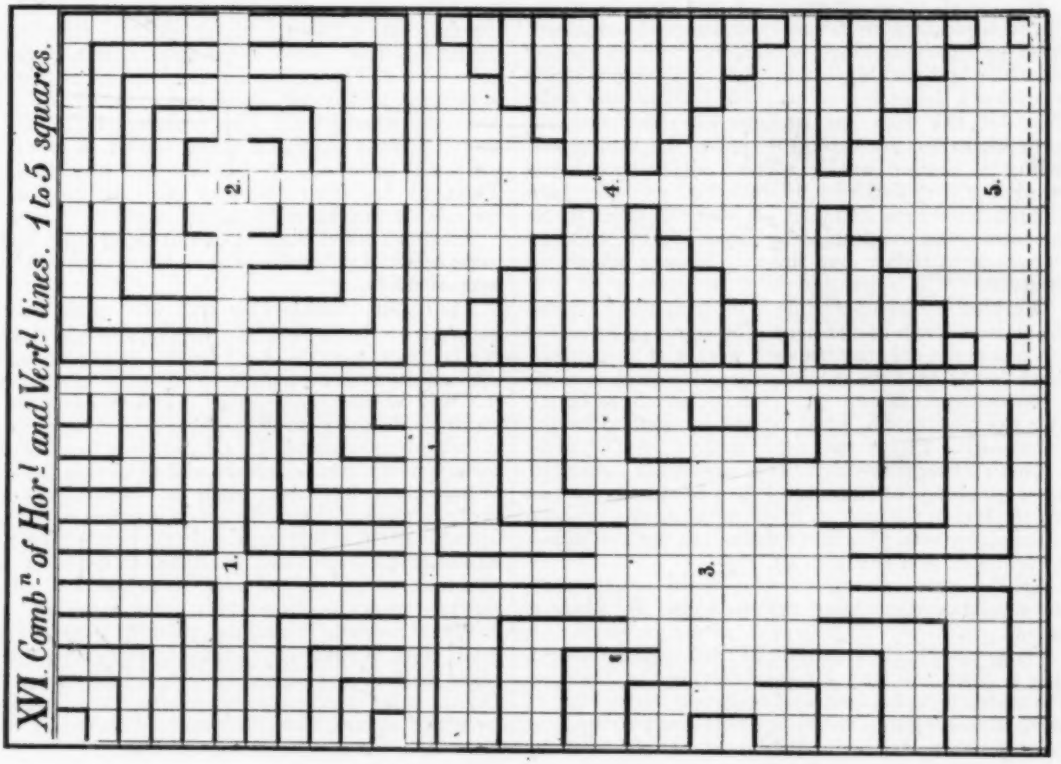
XVI. Comb.ns of Hor.l and Vert.l lines. 1 to 5 squares.
1.
2.
3.
4.
5.

PRACTICAL NEEDLEWORK.

BY MISS J. W. WARREN,
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THE last article on this subject came out in the April number, and dealt with garments in Standard IV. It also gave a short direction about marking in Standard V. The rest of the specimens for this standard will now be explained; and in a subsequent month will be found the diagrams promised.

The Tuck Specimen.—When teaching this work do not fail to point out that while the Schedule permits it to be by line of selvedge, tucks are very seldom required this way, but more often than not just the reverse, occurring as they do on drawers, skirts, and other garments of the kind.

Teach it first by line of selvedge, as it is easier and gives a better result; but do not confine your teaching to this way only. Notice while *two tucks* are to be fixed, only a *part* need be worked. Teachers should infer from this that to fix tucks is the more difficult work. Just a word here, therefore, on spacing.

(*a*) All tucks should be narrower than the hem.

(*b*) Tucks to be well proportioned should be nearer together than their own width.

(*c*) The fold of one tuck must not cover the tuck-stitch of the tuck just below.

(*d*) Tucks for ornament only, should be narrower than those for lengthening the garment later on.

If these four simple directions are borne in mind, the specimen will be correct, even without keeping to the width hem given.

Mode of Work.—Let your pupils first learn the stitch. Canvas is excellent for this, as exactness can be obtained. Point out before teaching, the difference between gathering-stitch and tucking-stitch. Let your pupils know *before* work the principle, viz., *both sides exactly alike.* Therefore, the work can be done on *either* side, but teach them to work on the *upper*, beginning and ending on the *under* side. Point out that neither is *wrong*, but they deal with an *upper* and an *under part.* The stitch requires as much left down as taken up on the needle, and the number of threads varies with the fineness of material; but the rule should be strictly observed.

Working on the upper side is recommended because the clearest stitch occurs here. To convince oneself of this one needs only to turn such work and look underneath to find that the stitches slip just enough to cause a blurred appearance. And since this must obtain with the most careful work, it will be well to have it underneath. Begin the work with a *run* of three stitches; bring it through to the upper side; continue the work along the *canvas.* When the end is reached put the last stitch back as in stitching, needle through to the under side, pick up threads—but not through—to right side, and so fasten off.

All the above directions refer to the actual stitch, and should be done upon canvas *before the fixing is taught.*

Fixing for Tucks in Actual Specimen.—Notice length only is given, but let your specimen be 7 inches by 5. The width tuck, here advised, will take with hem 5¼ inches to complete, leaving over an inch to spare at the top when finished. Point out simple facts by illustration: a tuck ½-inch wide requires 1½ inches to complete Refer to these three parts as the upper and under folds, and the third as that *upon which it lies.* Also that to these factors we must add space between, which, in this case, will be ¼-inch. The specimen will be made up of the following measurements:—1¼ inches for hem, the quarter is for turning in; 1¾ for each tuck, the *three halves* are for each tuck, the two quarters being for spaces between each; these measurements will be very clear to begin with, and come to 5¼, leaving 1¾ for the top above the last tuck. Your specimen is now complete, so far as spacing is concerned, and in detail you will proceed as follows:—Have the hem fixed and *hemmed*; you will need the hem to measure from in first tuck; let your tucks measure ½-inch when finished, and be ¼-inch apart. Give to each child a piece of cardboard 4 by 1 inch, upon which have marked inch, half, and quarter inches, or, in lieu of this, the tape-measure. Card is easier to adjust. Hold the work, with right side towards you, hem downwards, in left hand, measure from *hem-stitch* successively one quarter, for space ½-inch upon which tuck rests, another ½-inch for underneath; crease with finger and thumb here 1¼ inches in all; continue this along line of *hem-stitch*, at inch intervals, until the whole 5-inch length is creased. Now let your pupils turn the work, holding hem part underneath; and to the back the width of tuck must now be marked by a tacked line on upper side (see diagram), which must be taught as follows:—Hold edge of fold between finger and thumb, measure *down* from *fold* ½-inch, take a small *tack-stitch* one inch further along line of fold, *measure with card again*, bring cotton along from first stitch, place it under thumb of left hand, *take tack-stitch*, and you have a perfect plumb-line of an inch; proceed to the end, take a tack-stitch, cut off tacking-thread, and the tuck is fixed. Look at the diagram in next month's issue for a still more detailed explanation of this mode of tacking, as it is not at all usual, but is universally successful when tried. The running of the first tuck should precede the fixing of the second, as the line of work will be needed to measure the second tuck by. The work has been described and should be immediately *below* the tacking-line.

The work when finished should be creased down as tucks lie, and be perfectly free from any other than necessary folds.

The Calico Patch.—This will need great care and patience to do beyond the ordinary rough style, but can be made a work of art when clearly understood. An endeavour is here made to point out not so much the way as the rocks ahead. Refer to diagram constantly Seaming on the right side and hemming on the wrong are employed. Of your two lines of work, seaming is the *smaller* square, and hemming the larger. When *fixing* it *threads must be observed*, not necessarily in the work, but without exception in the fixing of *calico* patch. Unprinted shirting, holland, or coarse half-bleached calico are excellent to teach it upon. The first is certainly the best, it is soft and clear in thread, but not so cheap as the other materials.

When a patch is examined it will show, if rightly done, eight perfect right angles on right side, the four inner seamed, four outer showing the hemmed part. Do not make your patch bigger than that suggested, 2 inches square when finished. (This refers to the outer line, not that bounding the hole.)

Mode of Work.—Give each pupil an 18-inch square of calico, to represent an old garment. Upon this you can place nine patches. Vary the cotton to tell first from last, and so mark progress. When complete use it as a slate rubber. And while at work on a piece this size a girl learns to handle garments more deftly than she would otherwise.

Cut in the top left corner a hole about as big as a shirt button. Supply each pupil with a piece of calico 2½-inches square, this should be creased from corner to corner, so that the centre is defined, in which a pin should be placed. The crease on this first made is the inner or seaming line. This should be ¾-inch from edge on each side, and defined by thread. After this, a ¼-inch turn for the hem line should be creased and opened up again; the inner fold is preserved, and gives you in appearance a square less by ¾ than the original. Now let your pupils place this on hole centre to centre exactly; pin it once (see diagram), fold down to thread side by side, but one side at a time, working from centre of one side round each corner, taking care not to entangle large *in-fold* lying underneath, or it will not open up at back for hem. Now, having *seamed inner* square on *right side* all round, take out pins (it hasn't been tacked). Open it up, and turn it over to wrong side, where you will find a small hole; insert sharp blade of scissors here to all four corners in succession. *Cut* your *thin* old garment material nearly to the seam-stitched corner. This gives you four flaps, and when lifted these show you the broad fold lying *underneath*. Cut these flaps off about six threads from seamed side; open up your broad fold, flatten seams with thumbnail; fold down again the ¼-inch crease; *tack it all round*, and hem on *wrong* side. You will now have completed your patch. It is hoped that these directions are made clear by the assistance of the very full diagram that will appear next month, when the rest of the specimens will receive attention, and also those of the Sixth Standard.

(*To be continued.*)

NEW DICTATION TESTS.

Suitable for 'Unseen Tests' in Reading also.

STANDARD IV.

No. 114.

Cows in the valleys of Switzerland have a very good time. They are big, beautiful creatures of a dark mouse colour, with white muzzles. Each animal wears a bell, and has a name of its own. The tinkling of the bells in the early morning is one of the pleasantest sounds in that country of lovely scenery. Though the cow-herds are great sturdy fellows, they are exceedingly gentle with the animals under their care. While the cows are being milked, they may often be seen laying their heads against their keepers, thus showing their affection in much the same fashion that the cat and the dog adopt towards those they love.

No. 115.

The outcry against the omnibus company for their obstinate refusal to warm their public conveyances, has at last had the effect of inducing the managers to make a trial of foot warmers. In order to prevent passengers tripping over them, they are covered with a second lattice-work flooring. Persons who have travelled in the five omnibuses with which the trial was made, expressed great satisfaction with the experiment, and in a few days, trials will be made on a more extensive scale.

No. 116.

One of the birds of paradise is somewhat larger than a blackbird; the feathers of his throat and breast are plaited in a curious way, and form a sort of breastplate of green and bronze. On his back, just behind the head, the feathers rise in a fan-shaped cloak, which is so soft and rich-looking as almost to resemble velvet. Black is his general colour, which takes a fine violet hue in the sun. He does not belong to the most beautiful kind of paradise birds, whose plumage is so lovely that the birds are often hunted for the sake of it, but he is a handsome fellow for all that.

No. 117.

During the late storm, a snow-plough, driven by a powerful engine, was sent out to clear the line; at the same time a number of labourers, who had been engaged by an official unknown to the station-master, were already doing the same work. The drifting snow nearly blinded the driver of the engine, and being in ignorance of the presence of a crowd of navvies sweeping the lines, he dashed into them, cutting some to pieces, and fatally injuring several others.

No. 118.

By the Queen's Regulations, volunteers during a General Election are not allowed to appear in uniform, and drills are suspended. The result of this is that several London battalions will not be able to get through the annual inspection at the proper time, and thereafter many of the men will be away for the holidays, so that several corps will suffer severely in the capitation grant.

No. 119.

An oddity of Chili is the milk station. Here and there in all but the principal business streets is a platform upon which a cow is tied, and milked to order by a dairymaid whenever a customer calls. On a table are found measures, cans, and glasses, and often a bottle of brandy. In the morning these stands are surrounded by servants from the principal houses, women and children, with cups and buckets, awaiting their turn, while as fast as one cow is exhausted another is driven upon the platform.

No. 120.

The greatest difficulty that dentists meet with is the matching of false teeth with the natural teeth of their customers. The tooth factories supply dentists with rings upon which are strung thin, short metal bars, each carrying a tooth at its extremity. There are twenty-five of these sample teeth that run all the way from nearly white to a shade that is almost olive. Someone of the twenty-five usually almost matches the patient's natural teeth, and, at any rate, enables the dentist to match the teeth at the factory.

No. 121.

The sea-horse is an inhabitant of the Arctic regions. It is a huge animal with two big tusks, and its resemblance to a horse is of the slightest. They herd together on the ice, and seldom go to sleep without making one of their number act as sentinel. Excepting the whalers, their only real enemy is the polar bear. The sentinel is generally placed in the middle of the herd, and a strict and faithful guard is he. Seated in an upright position, and casting his eye constantly all round, he readily spies danger. When he has to sound the alarm he does so by making a great noise. This wakes his sleeping mates, who raise their heads and shoulders from the ice and look round.

No. 122.

A very singular custom prevails in Munich. Every destitute child found begging in the streets is taken up and carried to a charitable institution. Here he is photographed as soon as he arrives, in all his dirt and rags. He is kept and educated in the institution, and when he leaves it to make a start in life the photograph is given to him. He promises by an oath to keep it always as a reminder of the wretched state from which he was saved, and of the gratitude which he owes to the institution.

No. 123.

An emu can kick as hard as a horse. I have seen men kicked so hard by this vicious bird that their legs were broken. The emu stands on one leg and with the other strikes a quick and most paralysing blow. I never would have believed that a bird had such power had I not had ocular evidence of it during this trip. After two or three of our men had suffered from the terrible kicks of these birds we did not venture near them, but, after running our horses till we got close enough, would bring them down with our rifles.

No. 124.

When the late Emperor was Crown Prince of Germany he visited an orphan asylum. Noticing an ailing, sad-looking boy amongst the inmates, he took him in his arms and promised to be his godfather. The poor child, rather frightened at first at the affection of a stranger, at length grew very friendly, and began to play with the medals and other decorations on the distinguished visitor's breast. Some years afterwards, the Prince became the German Emperor, a post which he only filled for a few months, when he died to the grief of the whole world. The people of Germany resolving to raise a statue to his memory, decided that it should represent him with the baby tugging at his medals and crosses.

No. 125.

In Paris, the thousands of sardine and other tin boxes that are thrown away every month form the basis of an industry which has reached vast proportions. These refuse cans are stamped by machinery into tin soldiers, and sold so cheaply that the poorest children can possess them; yet the manufacturer makes a fair profit, which he could not do if he used new material.

No. 126.

In any case of faintness every obstacle to the freest action of the heart and lungs should be removed by loosening the clothing. But the first thing is to get the patient into a recumbent posture, and flat on the back. If the person is in a crowded assembly he should at once be taken into fresh air, but under no circumstances should anything be placed under the head. The more common form of fainting does not, as has been erroneously stated, necessarily tend to shorten life.

No. 127.

The scene of the late fire is within a stone's throw of the police station, the town hall, and the market place, and the police and the fire brigade set promptly to work, with the assistance of scores of willing hands, but their efforts were for a time completely baffled by the intensity of the flames which had broken out amongst the ruins, and it was necessary to prop up the adjoining buildings before the work of rescue could be properly undertaken.

No. 128.

A butterfly exists during its life for a certain period in four distinct forms, each one of which is totally unlike any of the others. These four stages of its existence are the egg, the caterpillar, the chrysalis, and the perfect insect. Begin, then, with the egg, and watch the insect through the whole course of its life, until it ultimately attains that final shape in which it is prepared to disport itself in the summer sunshine. Many of these tiny eggs present a curious and interesting appearance when viewed under the microscope.

No. 129.

As the tide goes out, the alligators bury themselves in the soft mud and lie there in a sleepy state, until the returning water brings with it the fishes and reptiles upon which they prey. Armed with a sharp-edged axe, the hunter wades across the mud, and jumping on the drowsy beast's shoulders, hacks at the neck until he severs the head from the trunk. In vain does the aroused alligator strike out with its tail, or turn itself round and round in the hope of 'throwing' its executioner.

STANDARDS V.-VII.

No. 98.

Among the dykes of Holland the embankments are planted with couch-grass and similar plants, which grow from underground runners, forming a huge tangled mass of roots, that hold the soil together, and so save the bank from being washed to ruins when the tide is higher than usual. Not only does the seaweed perform this duty, but its long ribbons rising through the water interpose a barrier that, while it permits the flow, considerably weakens its force. Though this may be the chief service that seaweed performs for man it is not the only one. It assimilates much of the sewage which we pour into the sea, and which otherwise might be washed back upon the shore. Even the masses torn up by the storms and cast upon the shore are of great intrinsic value.

No. 99.

The position of many of the assistants employed in the warehouses of the City of London, as brought to light by the National Union of Warehouse Assistants, is particularly hard. In many cases the workers are employed in basements two floors below the ground, in gaslight and foul air, for an average of seventy-two hours per week, and are paid 3½d. per hour. One of these warehouses, we are told, supplies the London Missionary Society with goods for shipment. It may be that the society is unaware of the harsh conditions existing; if not, perhaps it will institute inquiries, and the subscribers will ask themselves whether the society's work is truly promoted by the purchase of goods where these inhuman conditions exist?

No. 100.

Pitt was endowed with mental powers of the first order. His readiness, his apprehension, his resource, were extraordinary. The daily parliamentary demand on his brain and nerve power he met with serene and inexhaustible affluence. His industry, administrative activity, and public spirit were unrivalled—it was, perhaps, impossible to carry the force of sheer ability further. Chatham in most respects was inferior to his son. He was a political mystic; sometimes sublime, sometimes impossible, and sometimes insane. But he had genius. That flame it was, fitful and indefinable though it be, that gave to his eloquence a sublime and terrible note which no other English eloquence has touched.

No. 101.

It is not the fault of the African traveller that his adventures should be somewhat wearisome reading. One African tribe is very like another; there is little difference between one jungle and another. The traveller tramps along, sometimes in a forest, sometimes on a plain. He varies his pleasures by one day catching a fever, the next day by being half eaten by ants, the next day by beating one of his followers for insubordination, and the next day by extracting an arrow out of the follower's flesh. Occasionally, he gets a bit of goat for dinner; occasionally, a banana; and occasionally, nothing. When he has gone for a certain distance, he returns, and what happens to him going happens to him returning. And what he gains by all this beyond writing a book, I really do not know.

No. 102.

The other Saturday an unusual spectacle was witnessed in the Home Park at Hampton Court, when a magnificent oak was discovered to be on fire. The Palace fire brigade were quickly on the spot, and other steamers arrived shortly afterwards. The tree is said to be 1,100 years old, and one of the eight largest oaks in England. It is thirty-three feet in circumference, having an average diameter of eleven feet. The trunk is hollow for about ten feet, and several of the larger branches above that are also in a decayed condition. It was in the hollow of the oak that the fire burned fiercest, and the fine old tree was almost completely destroyed. The cause of the fire is unknown.

No. 103.

The largest keys ever constructed were the wooden ones made in Egypt upwards of forty centuries ago. These locks and keys, the earliest known, were both made of wood. The locks consisted of bolt and staple fastened to the woodwork of the door, and when the bolt was pushed some way into the staple, three wooden pins fell into holes made in the bolt, and the door was locked. In ancient times the key was looked on as a symbol of authority. On public occasions the steward, with all solemnity, was accustomed to march in front of those in authority, and a key was always hung over his shoulder as his recognised insignia of office.

No. 104.

It is well known with what affection the late Cardinal Manning was regarded by the very poorest in his own community; and he was very proud of his body-guard, as he called one or two rough labouring men who had constituted themselves his protectors after seeing him on various occasions struggling through a dense crowd on his way to his carriage after preaching. Latterly these self-appointed guardians of his person always arrived of their own accord when he was fulfilling his public engagements, and, having performed their labour of love, disappeared until the next time their services were required.

No. 105.

A tale of a remarkable escape from death comes from the Dutch East India Island, where a surveyor, taking bearings, suddenly turned round to find himself faced by a tiger. A native holding the surveying instrument was so startled that he turned a somersault and fell into a ravine below, leaving his master alone with the beast of prey. The only weapon the terrified surveyor had was a walking-stick, with which he mechanically struck out. Whether frightened by the walking-stick, the surveying instrument, or the appearance of the surveyor himself, is not mentioned; but the tiger ran away from the scene, and disappeared in the jungle.

No. 106.

A new machine has been fitted up for the collection of letters to be forwarded by the Post Office Express Service. It is in electrical connection with the Postal Telegraph Office opposite the station. On dropping a penny into the slot, and pulling out the slide, a brown-coloured envelope containing another envelope and a card appears. The communication is intended to be written on the card, which is then enclosed in the white envelope; and this, with the fees for delivery, which have been fixed at 3d. per mile, is re-enclosed in the outer envelope, and deposited in the box behind the flap which bears the printed instructions. The act of withdrawing the slide sends the call signal to the telegraph office, and a messenger is at once despatched to the station to take the message.

No. 107.

Thanks to the mediation of the Bishop of Durham, the great coal strike has now been brought to an end; but one may well pause, in the light of recent events, to inquire what the final issue of these gigantic and calamitous movements in the labour world is likely to be. One does not need much philosophic perception to see that the tendency of things is towards an aggravation of the evil rather than the reverse. These strikes are the British workman's means of putting the thumbscrew on the capitalist, and the more painful the process the greater the likelihood of his getting what he wants. But, as we are beginning to learn, it is not alone the capitalist who suffers—the entire community suffers with him; to such an extent, indeed, that a merely local strike may at any time rise to the magnitude of a national calamity.

No. 108.

The machine for printing a railway ticket is a marvel of neatness and efficiency, small in bulk and remarkably reliable, with no hidden works. Near the centre is placed the block of types composed for the particular journey on hand, and into an upright receptacle are put the pieces of cardboard, all that remains to be done being to switch on the driving belt, and the tickets are turned out while you wait. One after the other are the blank cards snatched from the bottom of the pile and hurried along the feed channel provided with grooved edges, so that all the machinist has to do is to keep his eye fixed on the end of each ticket as it emerges from the press, to see that the numbers are consecutive, and also perfectly distinct.

No. 109.

Looking back at the life of the late Archbishop, its most conspicuous feature is the record of remarkable growth. His mind was ever learning; his character ripened, mellowed, and sweetened to the end. His character was built up on simple, but solid foundations. He was real, straightforward, manly, possessed of judgment, candour, decision, and the courage of his opinions. His mental balance was complete, and the strength and beauty of his character was seen in the harmony of his talents and feelings. Without this proportion his strong gift of humour might have imperilled his position; with it, his humour became a valuable ally, enabling him to relieve tension without loss of dignity, and to place himself easily and naturally on good terms with his audience

No. 110.

To be worthy of its name, a novel should not merely amuse, it should convey instruction in the most entertaining form, so that it may be remembered almost without effort. It is desirable that men should be well informed on the history of former ages, on conditions of life, the manners of different peoples, and the salient points in the geography and scenery of our own and foreign countries. Works of fiction that convey information on such subjects, without exciting evil passions or demoralising weak readers, are proper reading for all classes. Where the tendency is evil they should be eschewed by all; but it is an absurdity to condemn all fiction for faults that apply but to a part.

No. 111.

We are, and ever must be if we are to maintain our position amongst the nations, a pre-eminently nautical people—in the beginning, perhaps, slightly piratical; in the sixteenth and seventeenth centuries perhaps a little too masterfully arrogant as to our rights of sovereignty in the narrow seas; in the eighteenth century and the beginning of the present one occasionally troublesome to foreigners through our strictly British interpretation of the right of search; but throughout all the generations a people delighting to go down to the sea in ships, and prone to protect the countless fleets of merchant ships which we have sent to carry our commodities to the uttermost ends of the earth by ships of war armed to the teeth, manned by sailors prepared to go anywhere and ready to do anything.

No. 112.

Among the nurses present at the meeting on Saturday was one who had travelled from Vancouver, and many others scattered about our Empire have become policy holders. For the present, at least, it is scarcely likely that the majority of our colonies could maintain separate organisations strong enough to carry on the work of such a Fund, and the devoted women who have gone out to isolated settlements will be well advised to keep up a connection with an Institution here, which has engaged the special interest of the Princess of Wales. One of the most practical of its arrangements is the Benevolent Fund, now amounting to ten thousand pounds, which is intended to provide immediate relief, either by loan or gift, to subscribers who have fallen into temporary distress.

No. 113.

It may frankly be granted that toy-makers are, as a rule, among the most conservative of industrials. Seeing that playthings are not usually very durable objects, their natural fragility being enhanced by the impetuous spirits and inquiring dispositions of the small people of whom they are the delight, it is not surprising that comparatively few of the toys of the ancients have come down to us. An adequate inkling of their nature may, nevertheless, be gleaned from the leather balls stuffed with wool, the dolls with articulated limbs, and the miniature crocodiles with moveable jaws which have been found in Egyptian tombs; while from the tombs of the early Christians in the Catacombs at Rome have been obtained considerable numbers of hoops, tops, marbles, and doll's-house furniture and utensils.

NEW COMPOSITION STORIES.—STANDARD V.

Suitable for 'Unseen Tests' in Reading also.

No. 142.

A THIEVISH TRICK.—Two men came to Vienna, and were invited by an old friend, who had risen to eminence and riches, to dine with him. One wore high boots, the other shoes. Shown into the dining-room alone, they much admired the richness of the apartment, and the one who had the boots on picked up a massive silver spoon and put it into his boot. The wrath of his companion was immense; he had no boot in which to hide a spoon. But he thought of a plan. After dinner he thanked their host for his kindness, and then said he would do a little trick in conjuring. The host consented. Taking up another of the big silver spoons he put it in his pocket, and then said, 'Now I will make this pass into my companion's boot,' bending down as he made the remark, and picking out the spoon that had been stolen. The host was delighted, and presently the two went out, the man without the boots with the spoon in his pocket.

No. 143.

THE MAN WITH THREE WIVES (A Russian fable).—A certain man, while his wife was still alive, married two other women. As soon as the news of this reached the king, he immediately ordered the man to be tried for the offence, and ordained that such a punishment should be discovered for him as would terrify the whole people, so that no one should in future be capable of attempting so great a crime. 'But if I see that his punishment is a light one,' he added, 'then I will hang all the judges around the judgment seat.' For three whole days they deliberate as to what punishment can be contrived for the culprit. At last heaven inspired them. The criminal was brought into court for the announcement of the judges' decision, by which they decreed that he should live with all his three wives at once! At such a decision the people were lost in astonishment, and expected that the king would hang all the judges. But before the fifth day arrived the culprit had hanged himself. And the sentence produced such alarm that since that time no man has done the like.

No. 144.

A HANDY SERMON.—The late Archbishop of Canterbury driving down a hill was confronted by a runaway horse with a heavy dray making straight for his carriage. He threw his sermon in its face. The horse was so bewildered by the fluttering of the leaves that it swerved and paused; the driver regained control, the sermon was picked up, and the bishop proceeded on his way. 'I don't know,' said he to his companion, the present Archbishop of York, 'whether my sermon did any good to the congregation, but it was of considerable service to myself.'

No. 145.

ONE GOOD TURN DESERVES ANOTHER.—A thirsty ant went to drink at the edge of a clear stream. The eddying current drew her in, and sent her whirling down the rivulet. A dove saw and pitied the poor struggling insect. She cropped a twig from a neighbouring tree, and placed it so near the ant that she got upon it and was saved. Not long after, the ant saw a fowler placing his nets in order to catch the dove. The bird did not notice him or his nets. Just when the dove was coming near the nets the ant bit the fowler's heel, and this caused him to start up so suddenly that he frightened the dove away.

No. 146.

A MUTUAL SURPRISE.—A lady and gentleman were travelling together on an English railway. They were perfect strangers to each other. Suddenly the gentleman said: 'Madam, I will trouble you to look out of the window for a few minutes; I am going to make some changes in my wearing apparel.' 'Certainly, sir,' she replied, with politeness, rising, and turning her back. In a short time he said: 'Now, madam, my change is completed, and you may resume your seat.' When the lady turned she beheld her male companion transformed into a dashing lady, with a heavy veil over her face. 'Now, sir,' said the lady, 'I must trouble you to look out of the window, for I also have some changes to make in my apparel.' 'Certainly, madam,' and the gentleman in lady's attire immediately complied. 'Now, sir, you may resume your seat,' said the lady. To his great surprise, on resuming his seat, the gentleman in female attire found his lady companion transformed into a man. He then laughed, and said: 'It appears that we are both anxious to avoid recognition. I have robbed a bank. What have you done?' 'I,' said he, as he dexterously fettered his companion's wrists, 'I am Detective Jones, of Scotland Yard, and in female apparel have shadowed you. Now keep still,' and he drew a revolver.

No. 147.

CAPTURE OF SARK.—The small island of Sark was taken by the French, and afterwards retaken in the following way: A ship of small burden anchored one day in the roads, and the captain sent word to the French commander that his only passenger was dead, and that he wished to bury him on the island. Permission was granted, but only on condition that all weapons were left behind. The invaders then took a coffin on shore with them, filled with swords and pistols. The Frenchmen searched every man as he came on shore, and then they were pulled up the cliff by means of ropes. The coffin was not searched. Some of the Frenchmen rowed to the ship to fetch some articles which had been promised. The sailors meanwhile carried the coffin to the little chapel of the isle: they opened it and armed themselves. They then overpowered the French guard left behind. The Frenchmen who had pulled for the vessel had been secured. The remainder ran to the cliffs, but seeing that their situation was hopeless, they surrendered themselves and the island to the conquerors.

No. 148.

A USEFUL MEMBER OF THE POLICE FORCE.—Some time ago a number of articles were missing from a mansion in the north, and on a search being instituted they were found concealed on a moor near by. It was supposed they would be removed from their concealment under cover of darkness, so a policeman, newly appointed to the force, was told off to keep watch, and apprehend the thief when he should come to remove his booty. About midnight the thief arrived on the scene, and commenced to gather up the stolen goods; but the policeman stopped him by shouting; 'Hi, man, leave that alone, will you! I'm watching that, so as to catch the man who stole them.' The thief very promptly did as he was told, and decamped as quickly as possible, leaving the policeman to catch the thief when he should come.

No. 149.

A STORY OF A MAGPIE.—The chatter of the magpie has often brought the bird into disgrace, but a case is recorded in which it rendered very valuable assistance. An old woman in Wales, supposed to have been pretty rich, died, and only twopence-halfpenny could be found in the house. Suspicion fell at once upon a poor girl who lived with her, but who positively declared she knew nothing of her mistress's affairs. While the old woman's friends were questioning her, a magpie repeatedly cried, 'I'll hide more yet, I'll hide more yet,' at the same time striking its bill on a particular spot in the floor. A carpenter having been sent for, the plank was taken up. It was fastened with a carefully hidden spring, and underneath. no less a sum than £900 was found.

No. 150.

ANECDOTE OF THE LATE KING OF ITALY.—The father of the present King of Italy was a keen sportsman, and often went out alone with his gun. One morning he met a peasant, who, thinking he was a gamekeeper, complained loudly of a fox which frequently robbed him of a fowl. He promised to pay the supposed gamekeeper if he would shoot the thief. The king promised to come very early next morning, when Reynard would be prowling about. He kept his word, and after a good deal of trouble, killed the fox. The peasant was delighted, took him to his cottage for breakfast, and then gave him two francs. The monarch, smiling, pocketed the money, saying that it was the first wages he had ever earned. Next morning he sent an officer with a present for the poor labourer, who was astonished to learn that he had been paying wages and giving a meal to his Sovereign.

No. 151.

WOLVES WHICH DIDN'T LIKE MUSIC.—A quaint story is told of a Scotchman who had been abroad, and was returning to his country. As he came through Prussia, knapsack on his back, he rested in the wood to take his mid-day meal. Soon his peace of mind was rudely interrupted by the appearance of two or three hungry looking wolves. The man thought these uninvited guests might be rather difficult to get rid of, so he gave them some of his bread and cheese, hoping that they would not care for it, and would soon leave him. This they did not do, but instead, came closer. He began to feel uncomfortable, and to wonder how he could defend himself if they attacked him. He suddenly thought of his bagpipes, which had been his constant companions in his wanderings. As soon as he began playing, the wolves fled away frightened out of their wits. 'Ah,' said the Scotchman, as he saw the wolves making off, 'if I had known you loved music so well you should have had it before dinner!'

No. 152.

PAGANINI AND THE LITTLE FIDDLER.—It is related of the famous Paganini that while walking in a street in Vienna one day he came across a little boy playing the fiddle. Learning that the lad was thus enabled to support his mother, besides a number of brothers and sisters, Paganini gave him all the money he had. Besides this, the great master took the boy's violin, and began to play. Speedily a large audience gathered around him, and after the performance he went round with the hat and obtained a goodly sum for the little fiddler.

No. 153.

A SAGACIOUS DONKEY.—A Spanish peasant had for many years carried milk into Madrid to supply his customers. Every morning he and his donkey, with loaded panniers, trudged the well-known round. At last the peasant became very ill, and had no one to go on the round. His wife proposed to send the faithful old animal by himself. The panniers were accordingly filled with cans of milk, an inscription was written by the priest requesting customers to measure their own milk and return the vessels, and the donkey instructed to set off with his load. He went, and in due time returned with empty cans; this he continued to do for many days. The house-bells in Madrid are usually so constructed that you pull downwards to make them ring. The peasant afterwards learned that his sagacious animal stopped before the door of every customer, and, after waiting what he deemed a sufficient time, pulled the bell with his mouth.

No. 154

A STORY OF A GUINEA.—An Irish gentleman, who was very much annoyed at the late hours kept by his sons, gave strict orders to John, a faithful old butler, to lock the door every night at eleven o'clock, and not to open it after that time. The young gentlemen were punctual to the hour; but one morning Master Tom was not home till one, when, seeing a light in the hall, he tapped gently at the door, and the following dialogue took place between Master Tom and the butler:—'Who's there?' 'It's I, John. It's I; open the door.' 'I couldn't, Master Tom—'twould be as much as my place is worth.' 'Oh, you must let me in, John!' 'I couldn't, indeed, Master Tom; but have you a guinea in your pocket, Master Tom?' 'I have, John—I have!' 'Put it in the keyhole, Master Tom, and I think it will open the door.' Master Tom did as he was told, and the door instantly opened. 'Thank you, John—thank you, John! There's half-a-crown for you; just run round to the stable with my horse.' 'Yes, Master Tom.' And John took the horse to the stable. Upon his return he found the door shut, and tapped for admission, when Master Tom played the butler's part over again, and told him there was an alteration in the lock, but if he'd put a guinea and half-a-crown in, they would open it.

No. 155.

THE BARBER'S POLE.—Boys and girls have doubtless often seen a parti-coloured pole projecting from barbers' shops. This custom has a curious origin. At one time barbers practised as surgeons, and when they had occasion to let blood from a patient's arm they gave him a pole to grasp, a tape and bandage being employed to tie up the arm after the operation. When the pole was not in use the tape was wound round it, and it was then hung up as a sign. In course of time, instead of exhibiting this pole, one was painted with stripes round it, in imitation of the actual pole and its tape. And now, though the barbers have long ceased to act as surgeons, the sign still remains.

No. 156.

'THOSE WHO LIVE IN GLASS HOUSES SHOULD BE CAREFUL HOW THEY FLING STONES.'—When James VI. of Scotland ascended the English throne, London was thronged with Scottish adventurers, who were by no means popular. An agitation was formed against them at the instigation of the Duke of Buckingham, the Court favourite, and the windows of the Scotsmen's houses were often broken. One day the Scots, in retaliation, mustered at Buckingham's mansion, in St. Martin's Fields, and smashed its windows, of which there were so many that the dwelling was called 'The Glass House.' The favourite thereupon complained to the King, who replied, 'Those who live in glass houses should be careful how they fling stones.' This is the origin of the above well-known proverb.

No. 157.

THE ARAB AND HIS HORSE.—There is a story told of an Arab who had a very beautiful horse. This Arab became poor, and had to sell everything, so that at last he had only his horse left. He was offered a large price for it, and at length made up his mind to sell it, as he and his family were in great want. So he mounted it, and rode away to a French gentleman who wanted to buy it. The money was counted out, and the Arab stood looking sorrowfully at his horse. He thought of the many times it had carried him on its back, of how his children had played with it and fed it, and then he looked at the heap of gold. After a while he thus spoke: 'And must I part with thee and never see thee more, thou that hast dwelt among us and been as a child to me? And to whom am I going to sell thee? To Europeans, who will tie thee up and beat thee! Ah, no! I cannot do it; I cannot part with thee! Return with me, my beauty, my jewel, and rejoice the hearts of my children!' Thus saying, he sprang upon his horse, and was soon out of sight.

No. 158.

WHY HE WANTED SPECTACLES.—A labouring man, who had never learned to read, noticed that the clergyman put on spectacles when reading the service in church on Sunday. He thought he should be able to read too if he got a pair of spectacles. Going to a neighbouring town, he entered a shop and asked to be shown some spectacles. He put on a pair, and tried to read a newspaper. Finding that he could not read with this pair, he asked for a better one. The shopman showed him several pairs, but as the labourer was not satisfied with any of them the shopman said he was afraid the man could not read. The labourer angrily replied, 'Of course I can't. If I knew how to read I should not require spectacles.' He left the shop disappointed and offended, but soon learnt that more is required to enable a man to read than a pair of spectacles.

No. 159.

'LUCKY PACKETS.'—When the so-called 'lucky packets' first became popular, and before such as contained sums of money were interdicted by the authorities, a somewhat remarkable occurrence happened at a certain village. A child went to the sweetstuff shop and invested a halfpenny in one of the new lucky packets, and, on opening it, found that it contained half-a-crown. Overjoyed, the child went back and invested in half-a-dozen more, and, lo! each one contained a sum of money. The news spread like wildfire, and there was a regular run on the sweetstuff man, every one of whose packets contained a money prize. At last the man refused to sell any more, went into his back parlour with the case containing the packets, and opened them. There was a prize in each. The explanation came later. It appears that the vendor of these packets had sent to the village by mistake a case containing winning packages all ready put away, to be mixed with cases containing the usual large number of blanks.

No. 160.

THE QUEEN'S REPROOF.—It is not generally known that the Master of Trinity College, Cambridge, has the peculiar prerogative of remaining covered in the presence of his Sovereign. Such is, however, the case, and a very amusing anecdote is told of the late possessor of that office. On the occasion of Queen Victoria's visit to Cambridge University, the Master of Trinity coolly kept his hat on his head whilst showing his Sovereign over the whole place. The queen did not appear to notice the circumstance, and at last the worthy master, feeling as if he ought to offer some explanation of his seemingly disrespectful behaviour, said to her: 'Your Majesty has, perhaps, been surprised at my presuming to keep my hat on in my Sovereign's presence; but it may have escaped your Majesty's memory that three gentlemen only, including the Master of Trinity, have always had the right to keep their heads covered in the presence of royalty.' 'Quite so,' replied the Queen, frigidly, 'in the presence of their Sovereign, mayhap, but not in the presence of a lady!'

No. 161.

A STORY OF A COLLIE.—The following is a true story about a collie who took a hansom:—He was lost in Oxford Street, and having spent some time in looking for him his mistress went home, and what was her surprise when she arrived to see him in the hall. The butler told her the story, and it was this: After the dog had been lost he saw an empty hansom, which he got into; and the cabby could not get him out, for he showed his teeth. He called a policeman, who could not move him either, but with some difficulty they read the name and address on his collar, and settled it would be best to drive him to his home. They shut the doors, and drove him home. When he arrived the cabby rang the bell, and asked for his fare (which he of course got), and then the butler opened the doors, and the dog jumped out as if nothing had happened

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PUPIL TEACHERS' COURSE.

I. FRENCH REGULAR VERBS.

A few hints respecting these, and correspondences pointed out, should greatly assist their acquisition by, and retention in the memory.

(*a*) Every second person, singular, except '*donné*' (Imperative), ends in '*-s*.'

(*b*) Every second person, plural, except the Past Definite Indicative ends in '*-ez*.'

(*c*) When the first person, singular, ends in '*-s*,' it is exactly the same as the second person, singular. The endings of the three persons, singular, are then '*-s*,' '*-s*,' '*-t*.'

(*d*) Every third person, plural, ends in '*-ent*,' except the Future, which ends in '*-ont*.'

(*e*) The inflections of the Future tense are those of the Present tense of '*avoir*.'

Je donnerai	= I have to give	= I shall give.
Tu donneras	= Thou hast to give	= Thou wilt give.
Il donnera	= He has to give	= He will give.
Nous donnerons	= We have to give	= We shall give.
Vous donnerez	= You have to give	= You shall give.
Ils donneront	= They have to give	= They shall give.

This fact accounts for the '*-ont*' instead of '*-ent*.'

(*f*) The Imperfect Indicative and the Conditional present have the same simple inflections. Both their third persons, plural, end not only in '*-ent*,' but in '*-aient*.'

(*g*) The first and second persons, plural, of the Imperfect Indicative and the Conditional are formed by inserting '*i*' between the Root and the Inflection of the Present Indicative and Future respectively.

(*h*) The first person, singular, of the Conditional is like the first person, plural, of the Future Indicative, except that '*s*' is added to the former.

(*i*) The Indicative Past Definite Plural ends in '*-mes*,' '*-tes*,' '*-rent*.'

(*j*) The Subjunctive Imperfect Singulars end in '*-sse*,' '*-sses*,' '*-t*.'

(*k*) The Subjunctive Imperfect Plural ends in '*-ssions*,' '*-ssiez*,' '*-ssent*.'

(*l*) The Subjunctive Present, first and second persons, Plural, are the same as the Indicative Imperfect, but the third person is like the Indicative Present.

(*m*) The Second Conjugation inserts '*-iss*' between the root and the ordinary inflection in the Present Participle, the Present Indicative, Plural, the Imperfect Indicative, the Present Subjunctive, and the Imperative.

(*n*) In the so-called Third Conjugation the insertion of the '*ev*, or '*v*' needs great care.

II. ENGLISH.

(*a*) During their apprenticeship, Pupil Teachers should become thoroughly acquainted with some one play of Shakespeare, such as *Julius Caesar* or *King Lear*. From this the poetry for repetition should be learnt, and examples of grammatical rules and exceptions should be stored up, so as to be ever ready for quotation. Thereby, too, will a more copious vocabulary be acquired, and a greater insight into the force of words; and as no man ever moulded English into readier flexibility than our greatest dramatist, perchance by the study of his works increased freedom and facility of manipulating words may result to the beginner. One common fault will certainly be found absent, viz., that of ending sentences with an unemphatic phrase, or even occasionally with a forceless word.

This fault is the opposite of the art of '*Climax*.'

'*The English attempted to retake Calais, but failed to.*'

Here the sentence would positively be stronger without the final word; for '*to*' is but the unemphatic sign of the Infinitive.

(*b*) *Nominatives Absolute* (of which we recently treated) give much trouble, especially when, as in the instance of the Verb '*to be*,' the accompanying participle is omitted.

'*In gallant trim the gilded vessel goes,*
Youth on the prow, and Pleasure at the helm.'

'*Youth*' and '*Pleasure*' are not Objectives governed by '*with*' understood, but Nominatives Absolute. The full construction would be '*Youth* BEING *on the prow, etc.*'

For another excellent example see p. 648 of May issue.

'He who attains not, ill aspires to rule
Cities of men or headstrong multitudes,
Subject *himself* to anarchy within.'

(*c*) When will the late Dr. Morell's 'Potential Mood' die out? There is no such Mood in reality. Any thinker will discern that in '*I can see the ship*,' '*see*' is Infinitive Mood governed by '*can*.'

Our learned readers may compare :—

'Navem *videre* possum,
Je puis *voir* le vaisseau'
'Ich kann das Schiff *sehen*,
'Δύναμαι ὁρᾶν τὴν ναῦν.

The Verbs should be thus parsed :—

can—Verb, Irreg., Defect., Indeterminate, Trans., Act., Indic., Pres., Sing., 1st, agrees with its Subject *I* and gov. *see*.

see—Verb, Irreg., Trans., Act., Prolative Infin., Pres., governed by *can* and gov. *ship*.

III. ALGEBRA.

(*a*) In 'Simultaneous Equations involving Quadratics' the Case, when the terms involving the unknown quantities in each equation constitute an expression which is homogeneous and of the second degree, demands a little consideration.

An expression is said to be *homogeneous* when all its terms are of the same dimensions.

Thus $6x^3 + 5x^2y - 7xyz$ is *homogeneous*, for each term is of three (or with the coefficients, of four) dimensions.

Equations like these can only be conveniently solved by finding the relation between the two unknowns. Then substituting, we obtain an ordinary quadratic which may be solved in the usual way.

Let us proceed then by stating the relation thus $y = vx$ where v is the unknown.

Example—

(*a*) $x^2 + xy = 15$; or $x^2 + vx^2 = 15$; $x^2(1 + v) = 15$
(*b*) $xy - y^2 = 2$; or $vx^2 - v^2x^2 = 2$; $x^2(v - v^2) = 2$.

∴ Dividing (*a*) by (*b*)

(*c*) $\frac{1 + v}{v - v^2} = \frac{15}{2}$; or $2 + 2v = 15v - 15v^2$.

or $15v^2 - 13v + 2 = 0$; or
$15v^2 - 10v - 3v + 2 = 0$; or $5v(3v - 2) - (3v - 2) = 0$,
or $(5v - 1)(3v - 2) = 0$; or
$5v = 1$ and $3v = 2$; or $v = \frac{1}{5}$ and $\frac{2}{3}$.

For sake of illustration we will take only the value $\frac{2}{3}$.

Now from (*a*) $x^2 + xy = 15$; $x^2 + vx^2 = 15$; $x^2 + \frac{2}{3}x^2 = 15$,
$\frac{5}{3}x^2 = 15$; $x = \pm 3$; etc.

(*b*) Simplify

$$\frac{a + b + \frac{b^2}{a}}{a + b + \frac{a^2}{b}} = \frac{a^2 + ab + b^2}{a} \div \frac{a^2 + ab + b^2}{b}$$

$$= \frac{a^2 + ab + b^2}{a^2 + ab + b^2} \times \frac{b}{a} = \frac{b}{a} \quad \text{Ans.}$$

(*c*) If two fractions are together equal to one, show that their difference is the same as the difference of their squares.

Let $\frac{x}{y}$ be the larger fraction, then $\frac{y - x}{y}$ = the smaller, then

also their difference $= \frac{2x - y}{y}$.

Also $\frac{x^2}{y^2}$ = square of larger fraction, and $\frac{y^2 - 2xy + x^2}{y^2}$

= square of smaller fraction, ∴

$\frac{x^2 - y^2 + 2xy - x^2}{y^2}$ = the difference of the squares $=$

$\frac{2xy - y^2}{y^2} = \frac{2x - y}{y}$ Q. E. D.

(*d*) Extract the square root of $1 + x$ to three terms.

$1 + x\ (1 + \frac{1}{2}x - \frac{1}{8}x^2$. Ans.

1

$2 + \frac{1}{2}x$ | x

$x + \frac{1}{4}x^2$

$2 + x - \frac{1}{8}x^2$ | $-\frac{1}{4}x^2$

$-\frac{1}{4}x^2 - \frac{1}{8}x^3 + \frac{1}{64}x^4$

$\frac{1}{8}x^3 - \frac{1}{64}x^4$

IV.—Girl Pupil Teachers should not leave their Domestic Economy until their fourth year, but in their first, second and third years should study the three stages of the Specific Subject, Domestic Economy, and should in their fourth year attend particularly to the Heads—I., Needlework; II., Savings and Investments; III., The Ingredients and Preparation of Food; IV., Rules of Health; V., Treatment of the Sick; VI., Clothing; and VII., Washing.

Parts I. and II. (price 3d. and 4d. respectively) of a very suitable work, compiled by Mrs. Beach, and published by Messrs. Joseph Hughes and Co., are now ready.

V. SCHOOL MANAGEMENT.

Not the least important part in a Teacher's curriculum is the knowledge of the Profession itself—that technical information and familiarity with detail, without which industry and skill will often go grievously astray.

Yet, because no paper-work in this subject is required from First Year Pupil Teachers, in the great majority of instances the subject is utterly neglected until the Second Year.

How many P. T.'s ever peruse the Code beyond that portion which directly and immediately concerns him? Nevertheless, everyone should possess a copy. In our

PUPIL TEACHERS' ROUTINE FOR AUGUST, 1892.

DAYS	YEARS	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
		1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson	1st Lesson	2nd Lesson	3rd Lesson
Monday	1	Analysis and Parsing	How to teach Reading	Div. of Decimals. Simple Practice	Analysis and Parsing	How to teach Writing	Map of Chief British Rivers	Analysis and Parsing	How to teach Arithmetic	Physical Geog. of Mountains and Rivers	Composition *or* Paraphrasing	Lives of great Men	Geography of England
	2			Stocks. Reduc. of Vulgar Fractions			Map of Spanish Peninsula			Latitude and Longitude			Climates of British Empire
	3		How to give an Object Lesson	Mens. of Parallelograms. Theory of required rules		Notes of an Arithmetic Lesson	Map of Mediterranean Sea		Notes of a Lesson on Form	Winds and Ocean Currents			Geography of Africa
Tuesday	1	Euclid I. 9. Knitting Sock	Literature, Repetition, and Writing	Scripture *or* Revision	Euc. I. 10, 11. Paper Patterns of Garments	Composition *or* Paraphrasing	Scripture *or* Revision	Euclid I. 12. Practise Stitches	English from Text Book	Scripture *or* Revision	Euclid I. 13. Practise Stitches	Literature, Repetition, and Writing	Scripture *or* Revision
	2	Euclid I. 15, 16. Any Needlework			Euclid I. 17, 19. Flannel Patch			Euc. I. 23, 26. Practise Stitches			Euclid Revision. Practise Stitches		
	3	Euc. I. 46, 47. Cross Cut Darn			Euclid I. 47. 48. Any Needlework			Euclid Deductions. Any Needlework			Euclid Deductions. Any Needlework		
Wednesday	1	Dates from 1035 to 1066 A.D.	Div. of Algebra. Practice Stitches	Instrumental Music *or* Literature	History from Canute to the Confessor	Instrumental Music *or* Literature	Euclid Deductions *or* Domestic Economy	History from 1042 to 1066 A.D.	Multiplication of Algebra. Knitting Sock	Instrumental Music *or* Literature	Anglo-Saxon Literature and Remains	Division of Algebra Any Geography	Euclid Deductions *or* Domestic Economy
	2	History from 1461 to 1473 A.D.	G.C.M. of Algebra. Practice Stitches		Dates from 1422 to 1478 A.D.			History from 1478 to 1485 A.D.	Revised Euclid. Knitting Stocking		Revise Literature from 1066 to 1485 A.D.	Division of Algebra Any Geography	
	3	History from 1649 to 1688 A.D.	Problems in Algebra. Any Needlework		Lives of Great Men			Literature from Elizabeth to James II.	Revise Euclid. Cross-Cut Darns		Revise Dates	Any Mensuration. Any Needlework	
Thursday	1	Geography of Ireland	English from Text Book	Div. of Algebra. Stocking-hole mending	Geography of Ireland	Literature, Repetition, and Writing	Revise Dates	Geography of Ireland	Prefixes, Roots *or* Affixes	Circulat. Decimal Problems in Vulgar Fractions	Geography of British North America	Miscellaneous Arithmetic	Map of Irish Sea
	2	Geography of India		Euc. I. 20, 23. Print Patch	Productions of British Empire			Geography of India		Any Vulg. Fractions Miscellaneous Problems	Geography of India		Map of Italy
	3	Geography of Asia		Revision of Euclid. Hedge-tear Darns	Geography of Asia			Geography of Africa		Miscellaneous Problems	Geography of Asia		Map of South Africa
Friday	1	Div. of Decimals Easy Multip. of Vulgar Fractions	Test Examination. (See appended Questions)		Decimals of Money. Simple Proportions	Lives of Great Historic Persons	Any Advanced Work	Dec. of Weights & Measures. Probs. in Vulgar Fractions	Test Examination. (See appended Questions)		Any Decimal Fractions Misc. Problems	Instrumental Music *or* Literature	Any Advanced Work
	2	Stocks. Money Decimals			Com. Proportion. Reduc. of Decimal Fractions			Com. Proportion. Vulgar Fractions of Weights			Miscellaneous Problems		
	3	Mens. of Parallelograms. Proofs of the required rules			Miscellaneous Problems			Miscellaneous Problems			Geography of Australia		
Saturday	1	Language	Physical Geography	Drawing	Music	Language	Physical Geography	Drawing	Mensuration *or* Sewing	Language	Physical Geography	Drawing	Music
	2										Science		
	3												Mensuration *or* Sewing

own school we always supply to every Teacher Messrs. Jarrold's 'Teachers' Diary and Pocket Book'; and we believe that not only greater efficiency is secured, but that thereby economy is promoted and the school finances actually benefited.

This little work contains the essence of the Code, and plenty of space for notes. In it we cause to be entered results of examinations, a monthly syllabus, names of backward scholars, dates of giving out new apparatus, etc. Any extravagance is thus checked, any excuse of ignorance of codal details is prevented, any doubt as to certain facts removed, carefulness and method are inculcated, and valuable professional training results.

VI. Model Answering or Examination Practice.

As a rule far too little time is given to reproduction, although some industrious ones endeavour to grasp a subject by merely answering every question upon it that they can possibly secure. Assuredly, however, more are guilty of the sin of omission than of commission.

Everyone of our readers, even if they do not take our Routine and schemes in the entirety, would do wisely to answer every month, in a model fashion, the questions that we give for that purpose.

(*For Correspondence, see end of Certificate Articles.*)

FIRST YEAR.

1. *Boys.*—A bought $\frac{7}{17}$ of a share in a company, and B $\frac{4}{17}$ of a share in the same company. The two together invested £71. What did each invest? Ans. £38 10s.; £32 10s.

Girls.—The value of $\frac{1}{8}$ of a property exceeds the value of $\frac{1}{10}$ of the same property by £17 11s. 2d. What is the value of the property? Ans. £6,672 3s. 4d.

2. How would you commence to teach extended notation to Standard II? Write down twelve examples of typical numbers.

3. Write in large hand the words '*Thoroughly impetuous.*'

Write in small hand the words '*Even the youngest are not infallible.*'

4. Analyse the following passage and parse the words in italics:—

'Of wealthy *lustre was* the banquet room,
Filled with *pervading* brilliance and *perfume*,
Before *each* lucid panel *fuming stood*
A *censer fed* with myrrh and *spiced* wood,
Each by a sacred tripod *held aloft*.'

5. Give the Plurals of pony, donkey, staff, stuff, ox, sow, memorandum, oasis, seraph.

6. Give an account of a Thunder Storm, *or* any Railway Journey.

7. Draw a Map of Ireland, showing distinctly the River Basins.

8. Describe the productions and government of Canada.

9. Give instances of low-lying and indistinct river-partings.

10. What were the different grades of Society and Office in Anglo-Saxon times.

11. Write a life of Dunstan.

12. Write out the scales of C, G, and F major; OR

Write out in Tonic Sol-fa the Major scale, and also (on the Imperfect method) the scale of the first sharp, and first flat remove.

13. In what order would you teach the 'Parts of Speech'? Construct sentences whereby you would show to Standard IV. the different uses of the word *as*.

14. Decline *fructus* and *cornu*, *or* write out a table of the French 'Possessive Adjective Pronouns.'

SECOND YEAR.

1. *Boys.*—On what principal would the compound interest for 2 years at 6 per cent. per annum equal the simple interest on £494 8s. for 2½ years at 5 per cent. per annum? Ans. £500.

Girls.—Sum I. of First Year Boys.

2. What would be the best way to work the following sums?:—
437½ articles at £3 6s. each. Ans. £1,444 3s. 3d.
840 „ „ £9 19s. 6d. each. Ans. £8,379.
Use 'Practice' only

3. Writing as in First Year.

4. Paraphrase the following:—

For them the Ceylon *diver* held *his* breath,
And went *all naked* to the hungry shark;
For them his ears *gushed blood*. For them in death
The seal on the cold ice with piteous bark
Lay full of darts. For them *alone* did *seethe*
A thousand men in troubles wide and *dark*.
Half-ignorant, they turned *their* wealthy wheel
That set sharp racks at work to pinch and *peel*.

5. Analyse the *above* passage and parse the italicised words.

6. What is Inflection? For what purposes is it employed in English? Give examples.

7. Draw a map of the Iberian Peninsula, marking (whether in the interior or the neighbouring seas) any spots of historic interest.

8. Mention, giving particulars, the six largest States of Europe, the six smallest, the six wealthiest, the six most populous, and the six most democratic.

9. Describe the different races and religions of Hindostan.

10. What is the influence of forests, slope of surface, and elevation upon climate?

11. Give dates of Statute of Labourers, Statute of Provisors, Magna Charta, Death of Henry V., the Mad Parliament, and Battle of Sluys.

12. What political alliances did we contract from 1100 to 1450?

13. Write out Euclid I. 21. If ABC be a triangle and AD a line drawn from A to middle point of BC, then the sum of AB and AC is greater than twice AD.
What are the knitting requirements for the various standards?

14. Set down as many rules as you can which will assist in conjugating the French Regular Verbs; OR,
Mention a few Masculine Nouns in *-a*, Feminine Nouns in *-us*. What is the Gender of *dies*?

15. Write out notes of a Lesson on '*Cancelling.*'

16. Give specimens, each four bars long, of $\frac{3}{4}$, $\frac{4}{4}$, $\frac{9}{8}$ time, OR, of six and nine pulse measures.

THIRD YEAR.

1. *Boys.*—If there are 277·274 c. ins. in a gallon of water, how many tanks, each containing 1,000 gallons, would be completely filled by the perfect drainage of one inch of rainfall upon 1,210 acres? Ans. 27373.

Girls.—The quotient of an operation in division is 515450, and the divisor is to the quotient as 9 to 65. Find the dividend.
Ans. 36787666500.

2. Write down four of the chief propositions in 'Proportion,' and give illustrative examples.

3. Analyse the following passage, and parse the words in italics:—

She *was* a gordian *shape* of dazzling hue,
Vermilion-spotted, golden, green, and *blue*;
Striped *like* a *zebra*, *freckled* like a pard,
Eyed like a peacock, and *all crimson barred*;
And *full* of silver moons, *that*, *as* she breathed,
Dissolved, or *brighter* shone, or *interwreathed*
Their lustres with the gloomier tapestries—
So rainbow-sided, *touched* with miseries,
She seemed, *at once*, some penanced lady *elf*,
Some demon's witch-mate or the demon's *self*.

4. State briefly the principal sources of our vocabulary.

5. What classes of words perform double grammatical functions? Give an instance of each kind.

6. Writing as in First Year.

7. Draw a map of Natal, Zululand, and Caffraria.

8. State what you know of Thibet.

9. Describe German Africa.

10. Classify the various kinds of winds, and briefly explain their origin.

11. Mention the principal men executed between 1485 and 1688

12. What were the constitutional gains during the '*above*' period?

13. Explain 'Decimal Notation' as to Standard IV.

14. Demonstrate Euclid I. 43. Describe a parallelogram equal and equiangular to a given parallelogram, and having one of its sides equal to a given straight line. OR,

What portions of 'Needlework' lend themselves to 'class' demonstration? What apparatus is required for collective teaching of 'Needlework'?

15. Write out four verbs requiring *de* before an infinitive, four verbs requiring *à* before the Infinitive, and four verbs governing the Infinitive without a Preposition; OR, the Latin Impersonal Verbs.

16. *Boys.*— $\left.\begin{matrix} x^3 + y^3 = 91 \\ x + y = 7 \end{matrix}\right\}$ Ans. $x = 4$ or 3, $y = 3$ or 4.

Girls.—How would you clean saucepans, bread-tins, and water-bottles?

17. *Boys.*—The area of a rectangle is 39 acres, 32 poles, and one side is double the other. Find the sides. Ans. 616; 308 yds.

Girls.—What would you do in sudden cases of severe cuts, faints, and burns?

18. Write out *from memory* eight bars (or measures) of any melody, describe its 'time,' and tell the length of each note or rest.

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OCCASIONAL EXAMINATION PAPERS.

A Board Scholarship Examination.

A NUMBER of scholarships are competed for by selected children attending the elementary schools in the district of the London School Board. For the benefit of teachers who may be intending to present candidates, and of others who wish to apply similar tests to their pupils, we print the questions given at the most recent of these examinations.

It should be stated that the three papers in Arithmetic, English Grammar and Composition, and English History and Modern Geography constitute a preliminary examination. The candidates who obtain two-thirds of the total marks for these papers, and not less than half marks in each subject, are eligible to compete at an intermediate examination. In this examination the remaining eleven papers are set, and each of the selected candidates must take not more than two of them. The most successful boys and girls are then subjected to a *viva voce* examination, in order that it may be discovered which are the best qualified to benefit by the scholarships to be awarded.

Candidates for the Technical Scholarship take the same preliminary papers but those selected for the intermediate examination are required to take Drawing (three branches), Algebra, Euclid, Mechanics, and Elementary Manual Training in Woodwork.

The scholarships are placed at the disposal of the London School Board by voluntary benefactions. They are of the annual value of from £20 to £30, and are tenable for different periods from two to five years.

To the following papers we append answers to the questions in Arithmetic and Algebra.

Arithmetic.

Time allowed, 3 hours.

(*All the working must be shown.*)

1. Express in words 135080306, and MDCCLXIV.

2. Divide 987654321 by 132. Work this by factors, and explain how the remainder is obtained.

3. A person takes 110 steps in a minute, the length of each step being 30 inches. At what rate per hour does he walk?

4. How much paper ⅓ yard wide will be required for the walls of a room 19½ feet long, 17 feet wide, and 10¼ feet high?

5. If 7 men in 13 days of 8 hours each mow 45½ acres, in how many days of 4 hours each will 26 men mow 104 acres?

6. The Greatest Common Measure of two numbers is 24, and their Least Common Multiple is 9792. If 576 is one of the numbers, what is the other?

7. Simplify $\frac{1\frac{1}{2} - \frac{3}{14}}{1\frac{1}{4} + \frac{5}{14}} + 1\frac{1}{2}$ of $1\frac{1}{12} - \frac{11\frac{1}{4}}{15}$.

8. Simplify ⅘ of a ton + ⅛ of a cwt. + ⅘ of a lb.

9. How can you tell by inspection whether a vulgar fraction can be expressed as a non-circulating decimal? Divide ·00918 by ·017.

10. If ·3 of an estate is worth £450 15s., what is the value of ·48 of it?

11. Find, by Practice, the rent of 37 acres 1 rood 28 poles at £2 2s. per acre.

12. What sum will amount to £926 2s. in 3 years at 5 per cent. per annum, compound interest?

13. A wishes to settle on B £100 a year clear of income-tax of 6d. in the pound. What sum of money must he invest for this purpose in a 3 per cent. stock at 90¾, brokerage being ⅛ per cent.?

14. A grocer sells one kind of tea at 2s. 6d. a lb., and loses 5 per cent., and another kind at 3s. 4d. a lb., and gains 14 per cent. He mixes the two together in equal proportions and sells the mixture for 3s. a lb. What is now his gain per cent.?

15. A person borrows £618 in two separate sums, at the respective rates of 3½ and 5 per cent. per annum; and he repays the two loans at the end of ten months with interest amounting to £22 10s. Required the amount of each loan.

English History and Modern Geography.

Time allowed, 3 hours.

1. Write down, with the dates of their accession, the names of the sovereigns of the House of Stuart, and trace the descent of the first of these kings from Henry VII.

2. Give some account of *three* of the following persons:—Hubert de Burgh, Thomas Cromwell, Prince Rupert, John Milton, Warren Hastings, Sir Robert Walpole.

3. In what reigns were the Constitutions of Clarendon, the Statute of Praemunire, and the Septennial Act enacted, and what was the one main object of each?

4. State briefly what you know about:—

(1) The Mad Parliament.
(2) Wat Tyler's Rebellion.
(3) The South Sea Bubble.
(4) The Conquest of India.

5. Explain clearly the leading causes of the separation of the American colonies from Great Britain; OR, trace the industrial progress of this country during the eighteenth century.

6. Give the position of the following places, and state with what event in English history each is connected:—Lewes, Calais, Falkirk, Londonderry, Blenheim, Quebec, Alexandria.

7. Explain the terms longitude and latitude. What is the latitude of a place seventy-six degrees south of London? How many miles is it distant from that city?

8. What are the Trade Winds, and how are they caused?

9. What are the chief manufacturing districts of Great Britain? From what sources does each obtain its chief supply of raw material?

10. Give the position, as exactly as you can, of *ten* of the following places, and the population of *two* of them:—Riga, Bordeaux, Suakin, Canton, Valparaiso, Yokohama, Limerick, Ottawa, Dundee, Melbourne, San Francisco, Colombo, Delhi, Hamburg, Honolulu.

11. Describe the different routes by which a traveller may reach Japan from London.

12. Describe the surface of Africa, and state what parts are occupied by European nations; OR, draw an outline map of Australia, showing the political divisions, chief physical features, and position of eight large towns.

English Grammar and Composition.

Time allowed, 3 hours.

1. Parse the words in italics in the following sentences:—

(1) *There* remained *but* five persons *in* the room.
(2) *Let* him *come* when he *can*.
(3) A short time *since* I said to my friend, '*Since* we part let us part in peace.'
(4) 'Away went Gilpin—*Who but he?*"

2. Analyse the following passages:—

(1) 'The evil that men do lives after them;
The good is oft interred with their bones.'

(2) 'There are who have at midnight hour,
In slumber scaled a dizzy tower,
And, on the verge that beetled o'er
The ocean tide's incessant roar,
Dreamed calmly out their dangerous dream,
Till wakened by the morning beam.'

3. What do you understand by (1) The Nominative Absolute, (2) Nouns in Apposition, (3) The Indirect Object? Give one sentence in illustration of each.

4. How do you distinguish between *personal* and *relative* pronouns? Give the personal pronouns of the third person *(Nom. Sing.)* and the neuter relative.

5. How does the Subjunctive mood differ from the Indicative in meaning and in form?

6. Explain the force and give examples of the use of the prefixes *re*, *be*, *for*, *gain*, and *with*.

7. Give the meaning of the following words, stating anything you know about their derivation, and write for each a short sentence containing it:—*procrastination*, *braggart*, *amphibious*, *quixotic*, *headstrong*, *antipathy*, *abstemious*.

8. Give in your own words the meaning of the following passage:—

'In Bruges town is many a street
Whence busy life hath fled;
Where, without hurry, noiseless feet
The grass-grown pavement tread.
There heard we, halting in the shade,
Flung from a convent tower,
A harp that tuneful prelude made
To a voice of thrilling power.'

9. Correct the following sentences, giving your reasons in each case:—

(1) Adversity both teaches men to think and to feel.

(2) That girl, whom I have said was a good walker, went with her cousin and I the whole way.

(3) Should the frost continue so sharp as last week the large pond will bare the boys.

10. Supply the proper capitals, stops, and inverted commas in the following passage:—once he asked tom davies whom he saw drest in a fine suit of clothes and what art thou to-night tom answered the thane of ross which it will be recollected is a very inconsiderable character o brave said Johnson.

11. Write a short essay on *one* of the following subjects:—

The advantages of a good education.

'Honesty is the best policy.'

'Life without industry is guilt.'

PAPERS SET AT THE INTERMEDIATE EXAMINATION

Algebra.

Time allowed, 2 hours.

1. What value of x will make $x^2 + 4 = 173$.

2. If $a = 0$, $b = 2$, $c = 4$, find the value of

$$3a\,(2b - c^2) + \left\{c^2 - (2a + 3b)\right\} + \left\{3c - (2a + 3b)\right\}^2.$$

3. Subtract $(a - b)^2$ from $a^2 + b^2$.

4. Multiply $x^3 + 6x^2 + 24x + 60$ by $x^3 - 6x^2 - 12x + 12$.

5. Resolve into factors $a^4 - 16b^2$.

6. Find the Highest Common Factor of $x^3 + x^2 - 2$ and $x^3 + 2x^2 - 3$.

7. Simplify $\dfrac{x}{y} + \dfrac{y}{x+y} + \dfrac{x^2}{x^2+xy}$.

8. Simplify $\dfrac{\frac{1}{x} - \frac{1}{y}}{\frac{1}{x^2} - \frac{1}{y^2}}$.

9. Solve the following equations:—

(1) $\dfrac{3x}{4} - 2 = \dfrac{2x}{5} + 5$.

(2) $\dfrac{1}{3x-3} + \dfrac{2}{4x-3} = 0$.

(3) $a\,(2x - a) + b\,(2x - b) = 2ab$.

10. The ages of two brothers amount to twenty-seven years. On dividing the age of the elder by that of the younger the quotient is three and a half. What is the age of each?

11. Solve the following equations:—

(1) $\left.\begin{aligned} \frac{x}{3} - \frac{y}{6} &= \frac{1}{2} \\ \frac{x}{5} - \frac{3y}{10} &= \frac{1}{2} \end{aligned}\right\}$

(2) $\left.\begin{aligned} x + y + z &= 1 \\ 2x + 3y + z &= 4 \\ 4x + 9y + z &= 16 \end{aligned}\right\}$

(3) $x^2 - 5x + 6 = 0$.

12. A person buys 8 lbs. of tea and 3 lbs. of sugar for £1 2s. 1d., and at another time he buys 5 lbs. of tea and 4 lbs. of sugar for 14s. 4d. Find the price of the tea and the sugar per lb.

13. The sum of £7 4s. was divided equally among a certain number of persons; if there had been two fewer persons each would have received one shilling more. Find the number of persons.

Animal Physiology.

Time allowed, 2 hours.

1. State the principal peculiarities of the divisions of the animal kingdom known as Radiata and Articulata.

2. Write a short account of (1) the external structure of the frog; (2) the structure and habits of the spider.

3. How many ribs have you? How do they move? How do the lower ribs differ from the upper?

4. Explain the construction of the different kinds of joints in the human body.

5. In what part of the human body is the liver, and what are its functions?

6. Describe the action of the muscles by which a man is enabled to stand upright.

7. Give an account of the process of digestion in the stomach.

8. Describe the chest and lungs, and state what changes the air and blood respectively undergo in respiration.

9. What is the Pulse? Explain how it is produced.

10. Explain the terms:—*nerve*, *nerve-centre*, *reflex nervous action*. Give an outline of the general plan of the structure of the nervous system in the human body.

Botany.

Time allowed, 2 hours.

1. Explain the methods of classifying plants.

2. Explain how to describe plants.

3. Enumerate the nutritive and reproductive organs of a plant.

4. Describe the chief forms of underground stems.

5. Describe the flower in the Poppy, Laburnum, and Rose.

6. Mention the chief points of likeness, and also the chief points of difference, between ferns and mosses.

7. Describe the fruit in the Peach, Potato, and Strawberry.

8. Describe the ripe seeds in the Bean and in Barley.

9. Give some of the names given to the chief forms of leaves, and mention examples of each kind of leaf.

10. Describe the flower, stem, and root of *one* of the following:—*wood-anemone*, *crocus*, *common violet*.

Chemistry.

Time allowed, 2 hours.

1. What is the distinction between a mechanical mixture and a chemical compound? Give examples of each

2. Name the agents by which chemical change can be brought about, and describe experiments to illustrate the action of each.

3. How would you show that water is a compound of two gases? What are these gases? State what measures you would adopt to render impure water fit for drinking.

4. Define the terms:—*molecule*, *atom*, *affinity*.

5. What are the distinctions between metallic and non-metallic elements?

6. What is nitrogen? How is it prepared? What are its properties? Name some of its most important compounds.

7. Explain the action of plants in purifying atmospheric air.

8. Mention three common processes in which carbon-dioxide is produced in large quantities. Compare the properties of carbon-dioxide with those of carbon-monoxide.

9. State the law of combination by weight in multiple proportions.

10. Give the equations which explain the changes which occur when (1) ammonia is added to lead nitrate, (2) nitric acid to calcium carbonate.

Domestic Economy.

Time allowed, 2 hours.

1. State the arguments for and against a purely vegetable diet.

2. Compare cotton with linen as a clothing material, in respect of cost and general utility.

3. What are the defects of hard waterin washing, and how can they be remedied?

4. How does personal cleanliness affect the condition of the blood?

5. Describe the best methods of warming a dwelling, with respect to efficiency, cheapness, and saving of labour. What are the chief objections to the ordinary open fire-grate?

6. Name the most effective ways of ventilating (1) a large lecture hall, (2) a bedroom.

7. Give simple directions for cooking a dinner consisting of a boiled leg of mutton, caper sauce, turnips, potatoes, and a baked rice pudding.

8. Mention the most suitable forms of nutriment for an invalid forbidden to take solid food.

9. How would you keep the air of a sick-room fresh and pure?

10 How would you treat (1) a severe cold, (2) an attack of croup, (3) a case of poisoning?

Euclid.

Time allowed, 2 hours.

1. Define a *superficies*, a *plane angle*, a *circle*, a *scalene triangle*, a *rhombus*, and a *rectangle*.

2. Draw a straight line perpendicular to a given straight line of unlimited length from a given point without it. How might the construction fail if the length of the line were limited?

3. Show that if from the ends of the side of a triangle there be drawn two straight lines to a point within the triangle, they shall be less than the other two sides of the triangle, but shall contain a greater angle. Enunciate any axioms or previous propositions required for the demonstration of this proposition.

4. Show that if a parallelogram and a triangle be on the same base, and between the same parallels, the parallelogram is double the triangle.

5. To a given straight line apply a parallelogram which shall be equal to a given triangle and have one of its angles equal to a given rectilineal angle.

6. Show that if a quadrilateral figure has its opposite angles equal it is a parallelogram, and the straight lines which bisect any two of its adjacent angles are at right angles to one another.

7. Show that if a straight line be divided into any two parts, the rectangles contained by the whole and each of its parts are together equal to the square of the whole line.

8. Show that if a straight line be bisected and produced to any point, the squares of the whole line thus produced, and of the part of it produced, are together double of the square of half the line bisected, and of the square of the line made up of the half and the part produced.

9. Describe a square that shall be equal to a given rectilineal figure.

10. If D be the middle point of the base BC of a triangle ABC, show that the squares on AB, AC are together double the squares on AD, BD.

Elementary Science.

Time allowed, 2 hours.

1. Classify the animal kingdom, and give the distinguishing characteristics of each principal division.

2. How does the nutrition of an animal differ from that of a plant?

3. From what plants, and from what parts of them, are the following obtained?:—*sago, indigo, flour, starch, gum, mustard, sugar, yeast.*

4. Sketch and explain an arrangement of pulleys by which 140 lbs. will keep in equilibrium one ton.

5. Explain how an echo is produced.

6. Explain precisely the function of a lightning conductor, and state the conditions which must be complied with in order that it should act effectively.

7. Describe the construction and explain the action of the ordinary form of plate-glass electrical machine.

8. Explain the cause of Dew. On what kind of bodies would you expect most dew to be deposited, and why?

9. What is the Solar Spectrum? What experiments would you make to prove that blue light differs from red and yellow in other respects besides colour?

10. Describe an ordinary Mercury Barometer. Why is it that the fall of the mercury is not uniform as it is carried up equal heights above the sea-level?

French.

Time allowed, 2 hours.

I.—TRANSLATE INTO ENGLISH:—

1. La connaissance des langues est utile aux hommes.

2. Quand viendrez-vous nous voir à la campagne?

3. Nous irions demain s'il ne pleuvait pas.

4. L'eau est plus fraîche aujourd'hui qu'elle ne l'était hier.

5. Notre père est-il chez lui?

6. Voyez quelle heure il est, s'il vous plaît.

7. Je ne puis pas vous le dire; ma montre ne va pas bien.

8. Un artiste avait peint un enfant tenant une corbeille de fruits. Un de ses amis, qui admirait ce tableau, voulant en montrer la perfection, disait à quelques personnes qui l'examinaient que les fruits paraissent si naturels que les oiseaux venaient les becqueter. Un paysan, qui avait entendu ces louanges, dit: 'Si ces fruits sont aussi bien représentés que vous les dites, il n'est pas de même de l'enfant puisqu'il n'affraye pas les oiseaux.'

II.—GRAMMATICAL QUESTIONS.

1. Write in the plural—*le cheval, la voix, l'habit, d l'œil, du ciel;* and in the singular—*les genoux, des maux, aux rois, les travaux, des églises.*

2. Write in the feminine—*vert, amer, sage, vif, secret;* and in the masculine—*douce, molle, libre, dernière, fraîche.*

3. Write the cardinal numbers from 1 to 20, and state how the ordinal numbers are formed.

4. Write out the future indicative and imperfect subjunctive of —*avoir, porter, recevoir, aller, savoir.*

5. What peculiarities of spelling are there in the verbs *avancer* and *jeter?*

6. Give the rules, with examples, for the agreement and non-agreement of the past participle in reflective verbs.

III.—TRANSLATE INTO FRENCH.

1. We have seen your aunt's house; it is larger than ours.

2. Has your father good fruit in his garden this summer?

3. Her father, mother, and sisters are now in the country.

4. 'How old are you?' said the king to him.

5. 'I was twenty-five last month,' replied the young man.

6. 'Are you cold?' 'No, but I am hungry.'

7. Make haste, go and fetch me my books which are in my room.

8. We burn coal for fire in houses and in steam-engines, and for steamboats and railways.

Latin.

Time allowed, 2 hours.

I.—TRANSLATE INTO ENGLISH.

1. Praemia diligentiae sunt grata discipulis.

2. Tempus humanae vitae breve est.

3. Dux vester ero; victores erimus.

4. In legione Romana erant cohortes decem, centuriae sexaginta.

5. Imperator ante ortum solis in castra pervenit.

6. Consul, victis hostibus, in Siciliam profectus est.

7. Allobrogibus imperavit, ut iis frumenti copiam facerent.

8. Hoc responso dato discessit. Postero die castra ex eo loco movent. Idem facit Caesar, equitatumque omnem, ad numerum quattuor millium, quem ex omni provincia et Haeduis atque eorum sociis coactum habebat, praemittit, qui videant, quas in partes hostes iter faciant.

II.—GRAMMATICAL QUESTIONS.

1. Decline in full, singular and plural, *lex severa, is bonus civis.*

2. Give rules for forming the degrees of comparison of adjectives in Latin. Give the comparative and superlative of *felix, celer, gracilis, benevolus, magnus.*

3. Write in Latin 9, 18, 43, 319, 4th, 13th, 27th.

4. Give the principal parts of *sum, amo, rego, moneor, vereor, possum, audeo, volo.*

5. What is meant by the Ablative Absolute? Give two illustrative sentences in Latin.

6. Give some rules for the use of the Subjunctive Mood in Latin.

III.—TRANSLATE INTO LATIN.

1. The king gives a book to the severe judge.

2. In the Roman Commonwealth were many brave men.

3. The memory of that one day was to Cicero most delightful.
4. The soldiers were praised by the General.
5. To whom does he give the greatest praise?
6. There is no doubt we ought to obey our parents.
7. On the day appointed the army sets out for Italy.
8. We often walked in the garden that we might refresh ourselves.

Mechanics.

Time allowed, 2 hours.

1. In what three states does matter exist? Distinguish between these.

2. What do you understand by a *force*, a *resultant*, *equilibrium*, the *tension* of a string, the *moment* of a force, *inertia*?

3. With what velocity must a body start, if its velocity be retarded 10 feet per second, and it comes to rest in 12 seconds?

4. What is meant by the parallelogram of forces? A point is subject to two velocities of 30 feet per second and 40 feet per second at right angles to each other. Find the resultant.

5. Why is the force of gravity less at the equator than in our latitude? Describe any experiment which will show this difference.

6. Define the centre of gravity of a body. Show how to find the centre of gravity of an irregular four-sided figure.

7. What is the meaning of the statement that in a machine what is gained in power is lost in motion? Illustrate the statement by reference to a wheel and axle.

8. Distinguish the three different kinds of levers, and give an example of each.

9. Give a description of the Common Steelyard. A body whose true weight is 10 lbs. appears to weigh 12 lbs. in one scale of a false balance. Find its apparent weight in the other scale.

10. A piece of stone, whose specific gravity is 2, weighs 6lbs. Calculate what it will weigh if immersed (1) in water, (2) in a liquid whose specific gravity is ·75.

11. How would you use a siphon so as to empty a vessel full of water? Explain why the water flows through the siphon.

12. Describe the Bramah Press.

Drawing.

Time allowed, 2½ hours

FREEHAND.

(Not more than one hour and a half to be allowed for Freehand.)

Candidates were required to copy in pencil carefully a printed example, increasing the height about two inches, and the width in proportion. No ruling or measuring of any kind allowed.

GEOMETRICAL.

1. At the extremities of a straight line 3 inches long, erect perpendiculars respectively 2 inches and 2½ inches long. From the upper ends of these perpendiculars draw two lines of equal length meeting in the first line.

2. Construct a triangle, the base being 4 inches long, the altitude 3 inches, and the angle opposite the base containing 45°.

3. About a given circle of 1 inch diameter circumscribe seven equal circles, each touching two others and the given circle.

PERSPECTIVE.

The questions on Perspective were only for candidates for the Technical Scholarship.

Height of the eye, 5 feet above the ground plane. Distance of the spectator, 12 feet from the picture-plane. Scale of drawing, ½ inch to one foot.

1. Place in perspective a block 6 feet long, 2 feet wide, and 2 feet high, lying upon the ground, with its long edges perpendicular to the picture plane, and that angle of the solid which is nearest to the spectator, 3 feet to the left and 1 foot within the picture.

2. Represent an equilateral triangle, sides 4 feet long, the nearest angle being 6 feet behind the picture plane, and 6 feet to the left of the spectator.

ANSWERS.

Arithmetic.—

1. One hundred and thirty-five millions eighty thousand three hundred and six. One thousand seven hundred and sixty-four.
2. $7,482,229 + 93$; $11 \times 8 + 5$ or $12 \times 7 + 9 = 93$.
3. 3½ miles per hour.
4. 97½ yards.
5. 16 days.
6. 408.
7. 1.
8. 12 cwts. 2 qrs. 14 lbs. 10⅔ ozs.
9. The denominator of its simplest form must contain no prime factor other than 2 and 5. ·54.
10. £721 4s.
11. £78 11s. 10·2d.
12. £800.
13. £3,111 2s. 2¾d.
14. 8 per cent.
15. £260 at 3½ per cent., £358 at 5 per cent.

Algebra.—

1. $x = 13$.
2. 46.
3. $2ab$.
4. $x^6 - 24x^4 - 144x^3 - 576x^2 - 432x + 720$.
5. $(a^2 + 4b)(a^2 - 4b)$.
6. $x - 1$.
7. $\frac{x+y}{y}$.
8. $\frac{xy}{x+y}$.
9. (1) $x = 20$. (2) $x = \frac{7}{15}$. (3) $x = \frac{a+b}{2}$.
10. Elder = 21 years, younger = 6 years.
11. (1) $x = 1, y = -1$. (2) $x = -3, y = 3, z = 1$. (3) $x = 3$, or 2.
12. Tea 2s. 8d. per lb, sugar 3d. per lb.
13. 18 persons.

MODEL ANSWERS TO QUESTIONS IN ELEMENTARY PHYSIOGRAPHY, 1892.

BY R. A. GREGORY, F.R.A.S.

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SERIES I.

1. (*a*) What is an oxide?

(*b*) Name two oxides which are always present in the atmosphere and give their composition.

(*c*) What is the most abundant oxide in the crust of the globe?

(*d*) State what you know concerning the composition and mode of occurrence of this oxide.

(*a*) An oxide is a compound formed by the union of oxygen with another element; that is, a binary compound having oxygen for one of its constituents.

(*b*) Carbon dioxide, or Carbonic acid, = CO_2; Water, or hydrogen monoxide, = H_2O.

(*c*) Silica, or oxide of silicon.

(*d*) Silica is composed of silicon and oxygen, and has the chemical formula SiO_2. It occurs *pure* in nature in the crystalline form as quartz and tridymite, and in the non-crystalline or amorphous form as opal. Many other minerals are mixtures of these varieties with each other and various impurities. Silica also occurs abundantly in combination with metallic oxides, forming silicates. The felspars and micas are examples of such groups of minerals.

2. (*a*) Why is the tube of a thermometer made with a narrow bore, while the bulb is large?

(*b*) Why is the top of a thermometer tube sealed up?

(*c*) Why is mercury the best liquid to use in a thermometer under ordinary circumstances?

(*d*) Under what circumstances is alcohol used instead of mercury?

(*a*) In order to make the thermometer sensitive to small variations of temperature: Let two bulbs be taken of exactly the same size, but having stems differing considerably in width. Fill each of the bulbs with mercury, and then place them together in hot water. The mercury expands the same amount in each bulb, but the indications on the stems will be very different. In the bulb with the wide stem the top of the mercury will have moved a short distance above its former position, but in the case of the bulb with the narrow stem the same increase of volume has been lengthened out, in consequence of the fine bore, so the top of the mercury will have moved a long distance.

(*b*) To prevent loss by evaporation: If the liquid in the thermometer were allowed to evaporate, the graduation of the instrument would soon be useless. By sealing up the end dirt is also prevented from entering the thermometer.

(*c*) It remains liquid through a long range of temperature, viz: 40° F. to 660° F.

Its rate of expansion is practically constant.

It has a low specific heat.

It is a good conductor of heat.

It is easily seen against the glass.

(*d*) In thermometers required to indicate low temperatures: Mercury freezes when its temperature is lowered to 40° below zero (Fahrenheit); alcohol has never been frozen. Alcohol is also frequently used instead of mercury in common thermometers, on account of its cheapness.

3. State the origin of the following appearances about an active volcano.

(*a*) The clouds which collect above it.

(*b*) The glow seen above it at night.

(*c*) The flashes of lightning playing about the cloud.

(*d*) The sounds which are heard.

(*a*) The vapour of water forms almost the whole of the white cloud which hangs over a volcano in action. Water is one of the chief agents of volcanic outbursts. Its vapour, steam, accumulates at volcanic centres, and in time overcomes the pressure tending to prevent its escape. The cause of explosive volcanic is thus the expansion and escape of masses of high pressure water vapour, and the clouds referred to are caused by the condensation of this vapour.

(*b*) The glare of the molten lava in the crater of the volcano being reflected from the clouds above. Steam escaping from a locomotive can often be seen at night similarly illuminated by the light of the open furnace door.

(*c*) The friction of escaping particles of water-vapour, and dust against the sides of the crater, and against one another, develops a large quantity of electricity. Different parts of the clouds get differently electrified, and the electrical condition of some clouds differ from that of the adjacent surface of the earth. When the electrical tension is sufficiently high, sparks pass between two clouds, or between clouds and the earth, and by raising the air and dust particles to a state of incandescence, produce the phenomenon known as lightning.

(*d*) The thunder which accompanies the electrical discharges, explosions of steam, and the grinding together of large and small masses of rock inside and outside the crater.

4. If you ascended to the height of 3½ miles in a balloon, carrying a barometer and a thermometer, state—

(*a*) The indication which would be given by the barometer.

(*b*) Your explanation of this.

(*c*) The indication which would be given by the thermometer.

(*d*) Your explanation of this.

(*a*) The barometer would fall to 15 inches or one-half the indication at sea level.

(*b*) The column of mercury or other liquid in a barometer balances a column of air of the same sectional area, extending to the limits of the earth's atmosphere. If the column of air is shortened by 3½ miles by ascending into the atmosphere, the mercury in the barometer falls. Since air is elastic, the layers near the earth's surface are much denser than those higher up; hence, although the atmosphere probably extends to a height of 200 miles, one-half of it is left behind in ascending 3½ miles.

(*c*) The fall of temperature would be about 1° Fahr. for every 300 feet of ascent, so if the temperature at the earth's surface were 60° Fahr., at a height of 3½ miles (18,480 feet) it would be 1° Fahr., that is, 31° Fahr. below the freezing point of water.

(*d*) The atmosphere derives its heat chiefly by radiation from the earth's surface, and not directly from the sun; air at a height of three-and-a-half miles is thus further removed from the radiating source than that at sea-level, and is consequently colder. The expansion of air in rising also causes the atmosphere at a high level to have a low temperature.

SERIES II.

5. Define force, energy, momentum, stress.

Force is any cause that alters, or tends to alter, the motion of a body, or that of its invisible particles.

Energy is the capacity or power of doing work. There are two kinds or forms of energy, viz., the energy which a body possesses in virtue of its motion, called *Kinetic Energy*, and *Potential Energy*, or energy of position.

Momentum is quantity of motion. It is measured by multiplying the mass of the moving body by its velocity.

Stress is the word used to denote the whole phenomena of the action, or the mutual action, between two portions of matter.

6. What are the facts which prove that the earth revolves round the sun, and not the sun round the earth?

(*a*) The Aberration of Light: Owing to the motion of the earth in its orbit, combined with the velocity of light, stars are always seen twenty seconds of arc in advance of their true position. The result of this is that in a year the stars describe ellipses in the heavens representing the earth's orbit in miniature. The major axis of each apparent ellipse is 40″, but the minor axis is least for stars on the ecliptic, and greatest for stars near the pole of the ecliptic, when it becomes equal to the major axis.

(*b*) The Annual Parallax of Fixed Stars: Some of the stars are seen in a slightly different direction when viewed at intervals of six months. This is because they are observed from two opposite points on the earth's orbit.

(*c*) Newton's Proof: It can be shown mathematically that the earth must move around the sun, and not the sun around the earth, in consequence of its smaller mass. In fact, the two bodies move around their common centre of gravity.

7 How has the shape of the earth's orbit been determined?

By measuring the sun's regular diameter throughout the year. The sun would always appear to have the same diameter if the earth moved around it in a circular path, but daily measurements show that it increases from July to January, and then decreases from January to July every year. By plotting down the series of measures, it has been found that the shape of the earth's orbit is that of an ellipse or oval, the sun occupying one of the two foci.

8. What is sidereal and what is mean time?

Sidereal Time is time reckoned or measured by the stars. The interval that elapses between two successive transits of a star—a sidereal day—is divided into twenty-four hours. The starting point of a sidereal day, and the point from which sidereal time is counted, is the 'First Point of Aries.' When this crosses the meridian of a place, the sidereal time is 0 hours 0 mins. 0 secs. The number of hours, minutes, and seconds that have elapsed since the transit of the First Point of Aries is the sidereal time at the moment of observation.

Mean Time is time kept by an imaginary sun moving uniformly along the equator at the same average rate as the real sun in the ecliptic.

SUMMER EVENING.

Andantino.
1st & 2nd Trebles.
Bass.
1. Come forth this sum - mer ev - 'ning, And we will wan - der far, And
Key F. Andantino.
1st S.
2nd S.
1. Come forth this sum - mer ev - 'ning, And we will wan - der far, And
B.
watch the gen - tle ris - - ing Of ear - ly ev - 'ning's star.
C.t.
watch the gen - tle ris - - ing Of ear - ly ev - 'ning's star.
The sun - set clouds are group - ing In beau - ty on the sky;..... The
f.F.
The sun - set clouds are group - ing In beau - ty on the sky; The
clos - ing flow'rs are bend - ing To ev - 'ning's lat - est sigh.
clos - ing flow'rs are bend - - ing To ev - 'ning's lat - est sigh.

2. The hum of children's voices
Is gently borne along;
The weary birds are singing
Their farewell evening song;
The distant church-bells ringing
In sweet unequal flow,
The breeze their music bringing,
Now faint, now louder grow.

3. The soft and placid murmur
Of yon still flowing stream,
It steals upon the spirit—
A fond and pleasant dream;
The sunset tints are fading
In soft and mellow light,
And soon the pale moon rising
Will shed its silvery light.

IN THE BABIES' ROOM: WHAT TO DO, AND HOW TO DO IT.

By Miss J. W. Warren,
Inspectress of Infant Schools, Leicester School Board.

Work in Clay.—How shall I begin? How shall I make you teachers love this occupation as it should be loved? How give you my own enthusiasm for it? I must content myself by hoping that you will, at least, by following out directions, draw somewhat nearer than you are to an appreciation of its value as a means of instruction.

My paper shall this month be in the form of answers to questions that might be asked on the subjects.

First, then, *Where shall we get the Clay?*—If you are in or near any provincial town, find amongst its industries either a clay-pipe maker or else a monumental mason, or go to your town School of Art and ask the master how to procure it. Every Art master knows, and very few are without it for the work of the students. A monumental mason usually has some, or can give you directions about it. A pipe-clay maker has it for his work, and will usually sell you a few pounds from time to time as you may need it. If you are in a village, try your nearest market town. Clay-pits occur in many parts of England, and from these you can get it, but it will need washing down and freeing from stone, shell, grit, and other impurity. As one may be obliged to do this, I will give a few simple directions for cleansing:—Take the rough lump of clay, sew it up in a canvas bag, and in a half a pail of clear water dip it up and down many times until your water is impregnated with the clay and your bag contains only stones, etc.; throw these away. Now let your water settle; after an hour or so you will find it has cleared and deposited a clayey sediment; pour off water, leave sediment in air, feel it on and off until it passes from creamy state into paste, later on plunge your fist in, and if it come out with no clay adhering, you will have got in into a working state. Now with hands take it all out of pail and knead it into a shapeable lump, which place on a roof, tile, or board, cover with a new wetted housemaid flannel, and your clay will be ready to work up.

Notice, this process is only needed in cases of rough clay direct from the pit. If obtained from School of Art masons or Pipe Makers it will usually reach you in excellent condition, which, however, you must maintain if you are to have any comfort in working.

Now, many years experience with clay has taught me that the chief difficulties lie not in its use but in the keeping, and teachers once taught exactly how to keep it in condition almost invariably attain marked success in the actual modelling. I will now, therefore, go still further and explain *What is to be done with* clay between the times of use:—

Buy it at about a halfpenny a pound, keep about forty pounds in hand for a class of sixty children. When bought, get a stout piece of copper wire or string, and cut it through to centre, see if it is moist throughout, it should cut as easily as a new cheese; if *not*, cut into large slices, sprinkle with water, knead up, and leave a day; if right now, it can be kept so by covering with a wet flannel, close down, to exclude the air, and this, in hot weather, wrung out afresh each day; in winter once every four days. Keep in a damp place; *frost* and *sun* both spoil clay.

If you find it *hard* when bought, break into small pieces, mix with water until quite dissolved; let water settle, pour off, and treat as explained in the case of rough clay, but it *must never be allowed to harden again* while you have it in school.

How can you tell when it is fit to use?—Cut a bit off, roll into ball form, pinch with fingers and thumb; if they sink with fair resistance to middle, and come out without clay sticking on, it is in good working order.

How to prepare it for actual lesson?—Slice off wedge-shaped pieces as many as you have pupils, roll up into ball forms that can be just grasped by child; place these in a tray or on a slate, and take into school-room. Do not prepare in your school-room, take it in perfectly clean and ready for immediate use.

Note.—I have so far explained the right consistency of clay for Infants' School Modelling. Clay modellers keep their half-done models in a much stiffer state, and the clay for correction and addition is not often as moist as I describe it; but it must be remembered I write for schools where with one lesson all is done that will be done to the model; hence the difference in the state of the clay used.

Having gone so far in getting our clay in order, how shall we teach the actual modelling?—Take up your place behind your table, have a piece of clay like that of each baby, distribute about the class beads, balls. Introduce the play by chatting about clay. Make yours first flat by pressure; next block it by compression; next round it by rolling it between the two hands; let little ones do the same, and they will make the ball in this way. Now break the ball up, and with them knead with thumb of right hand into palm of left all the clay into a compact mass again; work it round again into ball form. Now make a collection round the class of all nice ones; put some away for future use; knead the rest up altogether, sprinkle, and put away for another day.

Do not on any account call it dirty nor refer to dirty hands; avoid this and bear in mind that dirt is '*matter out of place.*' Clay lessons are exceedingly valuable, and must be introduced on a perfectly fair basis. All forms emanating from the ball may be taken in the babies' room—one day nuts, another day cherries, another balls, another apples—but vary the object more than the form, and introduce subjects with which you have previously dealt, such as eggs, shells, acorns. Give to every baby an object to copy. At the end of the general play let your little ones have free scope, and encourage them to make things round about; notice what is made, and talk to each child of his chosen subject; something in it most surely attracts him, or he would not choose it. Some teachers will ask whether hand-washing is necessary after lesson.

No, certainly not; with such a drawback we could not take it at all. Good clay is exceedingly cleanly, acting almost as a disinfectant. In a few minutes, if hands are rubbed together over the boards, they will be found cleaner than when the children began.

How often may the clay be used?—At least three times a week. Let it come as a last play, as it is found to be very interesting to the babies. Old slates do excellently as modelling-boards and need not be sponged more than once a month; rubbed roughly with duster answers ordinary purposes.

What modelling tools shall be used?—None but the fingers and thumb. The little models made

in this babies' class need only these nature's tools. A mistaken notion exists as to tools, most people thinking that some are absolutely necessary; but a good modeller uses his thumb more, perhaps, than any other means to his end. The writer found, years ago, in certain schools, many elaborate and expensive tools, casts, boards, etc.; but found not one teacher who had the slightest notion of forming the simplest model, and an absolute ignorance of clay-keeping.

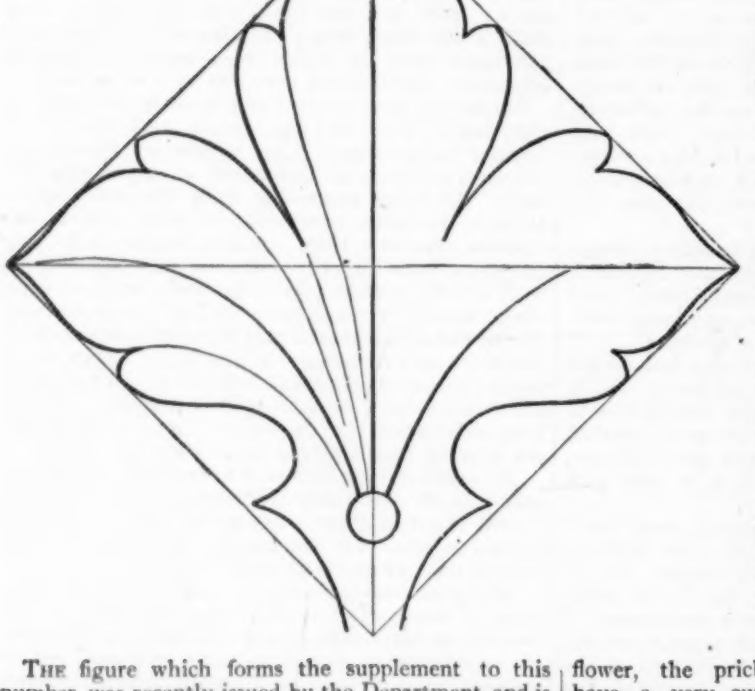
No lesson should last over twenty minutes, and one or more models should be given for copies. Do not imagine that the form is known. This is to rob the play of more than half its value.

When eggs or fruit-pieces are made, put together a basket, reserve the best with which to fill it, and so give point to the lesson. Worms, catterpillars, snails, form good natural subjects.

Forms springing from *ball*, *cylinder*, and *cube* may be dealt with; but, wherever possible, avoid these three actual objects, and take their near relatives—radishes, carrots. Sheep-cots, tents, etc., can be used as substitutes. Do not talk to babies about form; only talk of the objects made, thus bringing the forms under their notice. Next month my paper will take the form of stories illustrated with occupations.

(*To be continued.*)

FREEHAND EXAMINATION TEST FOR STANDARD IV.



The figure which forms the supplement to this number was recently issued by the Department, and is exactly one-and-a-half times the size of Inspector's copy. It fills a square placed with diagonals horizontal and vertical.

It is a very satisfactory exercise for the standard, giving scope for accurate drawing and good curves without crowded detail or any particular difficulty.

It illustrates the principles of growth and radiation, presenting them in a manner easily explained to, and understood by, the children. The upward and outward springing (or growth) of all the principal curves of the outline, as well as of the veins, must be carefully shown in copying the drawing. The lines radiate from the small circle, which may be compared with the junction of a flower and its stem.

RECREATIVE BOTANICAL PAPERS.

BY PROFESSOR J. R. GREEN, M.A.,

Examiner to the University of Cambridge.

V. Sultry August.

Last month, you will remember, we were obliged to leave unexamined the *woodruff* and the *goose-grass*, or *cleavers*, so troublesome to the pedestrian. We also postponed to this month the consideration of the *corn-flower*, or *blue-bottle*, the aromatic smelling *chamomile*, the woolly-leaved *yarrow*, which at first sight looks as if it might be an umbelliferous plant, and the *thistle*, with its large, deep purple flowers and thorny leaves. These plants, you will remember, belong to the third great sub-class of Dicotyledons, viz., *Corolliflorae;* plants, the stamens of which are attached to the tube of the corolla. As this is a very large and important sub-class, before passing to the consideration of the fourth, which is also the smallest division of Dicotyledons, we will gather, then, fresh specimens of these plants, and will also put with them the *ox-eye daisy*, *tansy*, *dandelion*, and *groundsel*, all common weeds, but more instructive to us than the rarest exotics.

In the hedges we may still find clusters of the beautifully-scented *wild honeysuckle*, or *woodbine*, and the graceful, twining *bind-weed*, or *wild convolvulus*, with its milk-white flowers. From the heath we may gather the pretty, light-blue *harebell*, the fairies' flower, and the *ling*, or *heather*, whose waxy flowers form such a favourite haunt of bees. By the way-side and in the garden-bed, here and there, we shall also see the bright, scarlet blossoms of the *pimpernel;* but for this we must look in fine weather, for the 'poor man's weather-glass,' as country people call it, closes at the approach of rain.

Let us now compare with the woodruff, which by this time is off flower, the prickly cleavers. Both these plants have a very curious arrangement of the leaves, quite unlike any we have yet seen. Instead of being arranged opposite to each other, like the leaves of the sage, thyme, marjoram, pennyroyal, dead-nettle,

and lavender we examined last month, or springing alternately from either side of the stem, like the leaves of the forget-me-not, several of them leave the stem at the same level, and they are said therefore to arise in whorls, and are called *verticillate*. In some other respects we see a close resemblance to the forget-me-not, or borage, tribe, *Boraginaceæ*. The corollas of the cleavers and of the forget-me-not are both regular and wheel-shaped, and the stamens are alternate with the lobes of the corolla. Looking more closely at our new flower, we notice a difference in the number of the parts. In *Boraginaceæ*, the stamens are five in number, and there is one stigma ; in *Rubiaceæ*, the order to which the woodruff and the cleavers belong, the stamens are four in number, and the style is two-cleft.

The British plants of *Rubiaceæ* may be readily known by their whorled leaves, which are not evergreen. The seeds of the cleavers have sometimes been used as a substitute for coffee, which is yielded by a shrub belonging to this order. Another name sometimes given to cleavers is goose-grass, from the avidity with which geese eat its young stems and leaves. Some very important medicines are obtained from species of *Rubiaceæ*. Ipecacuanha is the powdered root of a small plant growing in the damp, shady forests of Brazil, while *Cinchona*, a South American genus, yields Peruvian bark and quinine. The beautiful greenhouse shrub, the gardenia, belongs to this tribe.

Our dandelion, ox-eye daisy, tansy, groundsel, yarrow, blue-bottle, chamomile and thistle all bear a strong family resemblance to each other. What is popularly called the flower is really a head, or *capitulum*, made up of a number of tiny flowers, called *florets*. Let us first look at the dandelion, a plant the French call lion's tooth, *dent-de-lion*. The petals of its yellow florets are all strap-shaped, and each little flower, though so small, is *perfect*, containing both stamens, which are five in number, and a pistil. The strap-shaped corolla shows five notches at its top, indicating that it is composed of five petals joined together. Imagine five petals joined together to form a tube, and then suppose this tube slit up one side nearly to the bottom, and you have the corolla of the dandelion. If we now compare with the dandelion, the yellow, button-like flowers of the tansy, and the purple thistle, we shall find that the florets here are all tubular and perfect ; the corolla is formed like that of the dandelion, but the tube is not slit open. In the tansy the florets form a flat, in the thistle a convex head. The bright blue florets of the corn-flower, or blue-bottle are tubular too, but the outer florets, which are larger than the inner, are destitute both of stamens and pistils. The ox-eye daisy, the bitter chamomile, and the yarrow, all have in their flower-heads two distinct kinds of florets. The florets of the centre, or *disk*, are tubular and perfect ; those of the margin, or *ray*, are strap-shaped and never possess stamens, often not even pistils. Notice the difference of colouring in these plants. All the florets of the yarrow are white ; those of the groundsel, which has no rays, are all yellow ; while in the ox-eye daisy and the chamomile, the florets of the ray are white, and those of the disk yellow.

We have seen that these composite flowers, the daisy, thistle and their allies, agree in having their florets arranged in a head or capitulum. There are other characters possessed in common by the members of *Compositæ*. In every case, the calyx rises from the top of the ovary and becomes what is called a *pappus*, that is, either a chaffy margin of the fruit, or a tuft, or ring, of bristles, hairs, or feathery down. It is this feathery pappus we blow away from the dandelion heads, when we want to know from what quarter the wind comes. The corolla, as we have seen, may be either tubular or strap-shaped, but it is always in one piece, like that of the other members of *Corollifloræ*. The stamens are five in number, and they have their anthers joined into a kind of tube round the stigma, a peculiarity which readily distinguishes them from other corolliflora plants. They are said on this account to be *syngenesious*. We see thus that stamens are sometimes joined by their filaments, as in the St. John's wort, and the sweet pea, and sometimes by their anthers, as in *Compositæ*. Each mode of union has its appropriate name. The ovary is inferior, and the fruit is a solitary, erect seed crowned by the pappus.

Compositæ is the largest of the natural orders known to us, constituting about one-tenth of all described plants. Most of the plants composing our salads—endive, succory and lettuce—belong to this tribe. The roots of the dandelion and of chicory, when roasted and ground, are used to adulterate coffee. The young involucres, or assemblages of bracts round the flower-heads of the artichoke, *Cynara Scolymus*, together with the receptacles are edible, but it is the Jerusalem artichoke, a near relative of the sun-flower of our gardens, that generally appears on our tables. Its tubers form a favourite vegetable, and its roots are made into Palestine soup. Chamomile and feverfew, elecampane and coltsfoot have valuable medicinal properties, while tarragon is grown to give an agreeable flavour to vinegar. Of garden flowers, the showy sun-flowers, dahlias, marigolds, southernwood, chrysanthemums and marguérites belong to this order.

Let us look now at our ling, or heather, and our harebells, the 'blue-bells of Scotland.' At first sight, we might be inclined to think that these delicate, bell-shaped blossoms belonged to the same order. Let us glance then more closely at them. In both the calyx is four-cleft and persistent, remaining till the fruit ripens, and the corolla is bell-shaped. The harebell has, however, a stem with a milky, bitter juice, an inferior ovary containing two or more cells. These are the marks of *Campanulaceæ*, the bell-flower tribe. The ling, or heather, on the other hand, has evergreen leaves, and a superior ovary, in common with other members of *Ericaceæ*, the heath tribe.

The members of *Campanulaceæ* are very ornamental, numbering among them, as they do, the beautiful bell-flowers of our gardens ; but the order furnishes us with very few useful plants. The rampion is, however, largely cultivated in France and Italy for its roots, which are boiled tender, and eaten hot with sauce, or cold with vinegar and pepper.

Ericaceæ, the heath tribe, is also of more importance to the horticulturist than of general use. In the greenhouse heaths, we have the greatest beauty of form and delicate waxiness of aspect. They come mostly from the Cape of Good Hope. Rhododendrons, 'the roses of the Alps,' and the beautiful evergreen strawberry-tree, so called from its globular, scarlet berries, rough with minute hard grains, belong to this order. The smallest and most insignificant member of this tribe is pretty, and the ling with its bell-shaped corolla, concealed by the rose-coloured leaves of the

calyx, outside which are four small green bracts, which seem to form a second calyx, forms the glory of the moors. Indifferent to soil, and capable of enduring alike cold and the most parching winds, it affords not only shelter but food to the mountain hare and to red and black grouse, which conceal themselves among it and feed on its young shoots. So fond of heather are bees, that in Scotland and the North of England bee-hives are carried at the beginning of August from the cultivated to the heathy districts, and are brought back in the autumn.

The scarlet pimpernel, whose vivid flowers, from their property of expanding only in fine weather, have gained for it the name of 'poor man's weather-glass,' belongs to an order whose best-known plants flower in the spring. It is a cousin of the primrose, cowslip, and 'dewy oxlip.' Like these members of *Primulaceæ*, the primrose tribe, it has a regular, persistent five-cleft calyx, stamens inserted on the corolla and opposite its segments, which they equal in number, and a free one-celled ovary with free-central placentation. The capsule, or seed-box, is very curious. Instead of splitting vertically along its sides, as most capsules do, it splits horizontally, so that the top comes off like a little lid. This is called a *pyxis*. The polyanthus, auricula, and cyclamen are favourite ornamental plants of this order. Cowslip flowers are made into wine by country people, and the leaves of the auricula form a homely remedy for coughs.

In the dodder, we have one of those curious plants which are called parasites, because they derive their nutriment from the plants on which they grow. It has a branched, climbing cord-like stem, no leaves, and globular heads of small wax-like flowers. The seeds germinate in the ground, but the young plants climb the stems of adjoining plants, and when they have taken root in them lose their connection with the ground. Most abundant on the furze, it is also found on the heath, thyme, and potentilla. Like the wild convolvulus, or bind-weed, it has a persistent calyx, a regular, plaited corolla, from the base of which the five stamens spring, and a free ovary with united styles and two or three cells, in each of which are two seeds. These are the marks of *Convolvulaceæ*, the bind-weed tribe, which furnishes us with the scammony of the druggist, and jalap, a preparation of resin obtained from the roots of a tropical climber, with long crimson flowers. The sweet potato belongs to this order, as do the moon-flower and other ornamental species.

The pretty, gaping flowers of the wild honeysuckle, or woodbine, have a small, five-toothed calyx, a tubular corolla, irregularly five-cleft, five stamens, and a thread-shaped style with a knobbed stigma. The fruit is a berry, the seeds being immersed in pulp. To the order *Caprifoliaceæ*, the woodbine tribe, belong also the elder, the guelder-rose, the laurustinus, the snow-berry, and the 'little northern plant, long overlooked, depressed, abject, flowering early,' which the great botanist, Linnæus, selected to bear his name. The leaves, flowers, and fruit of the elder are sometimes used medicinally.

We will now arrange our corollifloral plants in their brown-paper sheets, first preparing for them a coloured wrapper with the inscription: '*Corollifloræ*, Dicotyledons with united petals and epipetalous stamens.'

Our first sheet will contain the sage, thyme, marjoram, penny-royal, dead-nettle, and lavender, all of which we found last month belong to *Labiatae*, *the labiate tribe;* plants with square stems, opposite decussate leaves, a labiate corolla, didynamous stamens, and a four-lobed ovary, from the base of which springs the style.

The second sheet will contain the forget-me-not and the comfrey and borage, if we have been able to get them. It must be labelled '*Boraginaceæ*, *the borage tribe;* plants with terete stems, alternate leaves, regular calyx and corolla, stamens five in number, and arranged alternately with the corolla-lobes, and an ovary like that of *Labiatæ*.'

The third sheet will have four occupants: the musk, toad-flax, snapdragon, and foxglove, and its label will be: '*Scrophulariaceæ*, *the fig-wort tribe;* plants with an irregular corolla, (generally) didynamous stamens, and a two-celled ovary with axile placentation.'

The fourth sheet will contain the bittersweet, potato, and tomato, and must be marked: '*Solanaceæ*, *the nightshade tribe;* plants with regular flowers, five stamens, and a two-celled ovary with axile placentation.'

The fifth sheet will have two specimens: the wood-ruff and the goose-grass, or cleavers, and must be labelled: '*Rubiaceæ*, *the madder tribe;* plants with whorled leaves, regular corolla, stamens four, alternate with the lobes of the corolla, and nut-like fruits.'

The sixth sheet will contain the dandelion and its relations, the blue-bottle, or corn-flower, the ox-eye daisy, tansy, groundsel, yarrow, chamomile, and thistle. It must be marked: '*Compositæ*, *the composite tribe;* plants whose inflorescence is a capitulum, the calyx rising from the top of the ovary and becoming a pappus, corolla gamopetalous, tubular or strap-shaped, stamens five, with syngenesious anthers, ovary inferior, one-celled, fruit a solitary, erect seed, crowned by the pappus.'

The seventh sheet will contain the harebell, and possibly some of the garden species of campanula. Its label will be '*Campanulaceæ*, *the bell-flower tribe;* plants with a milky, bitter juice, regular flowers, persistent calyx, and an inferior, two or more celled ovary.'

The eighth sheet will contain the ling, or heather, and must be labelled: '*Ericaceæ*, *the heath tribe;* plants with evergreen leaves, calyx persistent, inferior, corolla regular, stamens equal in number to, or twice as many as, the lobes of the corolla, ovary superior.'

The ninth sheet will contain the scarlet pimpernel, and to this plant you must add in the spring the primrose, cowslip, and oxlip. The label will be marked: '*Primulaceæ; the primrose tribe;* plants with a regular, persistent five-cleft calyx, stamens equal in number to, and arranged opposite the carolla lobes, ovary free, one-celled, placentation free-central.'

The tenth sheet will contain the dodder and bind weed, and perhaps the garden convolvulus, either the pretty *Convolvulus minor* of the border, with its blue and white flowers, or *Convolvulus major*, the purple, red, and variegated blossoms of which make it one of the most popular of creepers. The label will be: '*Convolvulaceæ*, *the bindweed tribe;* plants with a persistent calyx, a regular, plaited corolla, from the base of which the five stamens spring, and a free ovary with united styles and one to four cells, with two seeds in each.'

The eleventh sheet will contain the honeysuckle, and must be labelled '*Caprifoliaceæ*, *the woodbine tribe;* plants with a five-toothed calyx, 4-5 cleft corolla, stamens equal in number to the lobes of the carolla and alternate with them, fruit, a berry.'

Having now arranged the leading orders of *Corolliflorœ* in their coloured wrapper, we will begin the investigation of the fourth sub-class of Dicotyledons, the *Monochlamydeæ*. The plants we have now to seek are unattractive to the eye, and come mainly under the category of weeds. In waste places and by the road-side we shall find the *goose-foot*, with its mealy-looking leaves, the *stinging-nettle*, dreaded by the gatherer of wild flowers, and the *common knot-grass*, with its minute, flesh-coloured or greenish-white flowers. Abundant in ditches and on the river bank are the slender, drooping, greenish spikes of the *water-pepper*, and the large-leaved *water-dock*, while in the meadows the reddish-green flowers of the *sorrel* are waving among the grasses. The garden may supply us with two plants—the *spurge*, a troublesome weed with acrid, milky juice, and the climbing *hop*, a graceful shelter for arbours.

Now that we have brought this group of insignificant-looking weeds indoors for examination, we see that they all agree in one particular. Instead of having two coverings of flower leaves, like nearly all the specimens we have hitherto examined, they have only one covering, which is called a *perianth*. This characteristic gives its name to the sub-class, which is called in consequence *Monochlamydeæ*, or *Incompletæ;* plants with only one flower-covering.

We will first examine our goose-foot. The flowers are small and inconspicuous; the perianth, which is deeply five-cleft, remains unaltered, and finally closes over the single seed, the stamens, which are five in number, spring from the base of the perianth, and the ovary is superior with a two-cleft style. These are the marks of *Chenopodiaceæ, the goose-foot tribe*, which numbers among its members the beet, mangold-wurzels, spinach, and the mustard-tree of Scripture. The glass-wort, found in abundance on salt-marshes, is very rich in soda, which is used in the manufacture of glass; hence the name of the plant. The leaves of the goose-foot, particularly the younger ones, have a very mealy appearance. This is due to the presence of very singular hairs, which are inflated at their ends almost like little bladders. These hairs are very numerous.

The common knot-grass bears a close resemblance to the water-pepper, the sorrel, and the great water-dock. All these plants belong, indeed, to one order, *Polygonaceæ, the dock tribe*. On examining them, we shall not fail to notice the alternate leaves, furnished at the base with membranous stipules, which encircle the stalks. These stipules are a very marked feature of the order, and are called *ochreæ*. The perianth is deeply three-six parted, and free from the ovary, and the stamens, which are five to eight in number, spring from the base of the perianth. There is one ovary, and the fruit is a nut; the knot-grass has three styles, and the fruit is triangular. The sorrel is *diœcious*—that is, the stamens and pistils are borne on different plants—and the herbage is very acid.

The *Polygonaceæ* have acid, astringent leaves and nauseous, purgative roots. This is well seen in the rhubarb, the leaf-stalks of which make delicious tarts, while the powdered root forms the well-known aperient. The buckwheat is cultivated in England as food for pheasants, but in some of the countries of Southern Europe the flour derived from its seeds is made into bread. The juice of the water-pepper is said to cure pimples on the tongue.

The common weed we call petty spurge is the representative of a large and important order. Let us note carefully its flowers. They are *monœcious*, collected into heads which are surrounded by bracts forming a cup-shaped involucre. Within the involucre are a number of bodies looking like stamens which surround a stalked ovary, and give, at first sight, the appearance of a single flower. This is not really so, as each stamen represents a single male flower, because it is jointed in the middle, and has at its base a separate scale. There are really several monandrous male flowers surrounding a central stalked female, which latter consists of a three-celled ovary with a three-cleft style. The fruit consists of three single-seeded carpels.

The *Euphorbiceæ*, or *spurge tribe*, is characterised by the acrid, corrosive, and usually milky juice of its members. It contains, in consequence, many poisonous plants. The gum resin of the druggist, obtained from three plants of this order, is so acrid as to produce inflammation of the nostrils among those who powder it; the manchineel tree is so poisonous that persons are said to have died from merely sleeping in its shade; and the milky juice of the manioc has been known to cause death in a few minutes. The poisonous principle in the last case may be dispelled by heat, when the grated root forms the basis of the nourishing food called Cassava. Tapioca is also prepared from this shrub. Two valuable medicines, croton oil and castor oil, are obtained from plants belonging to *Euphorbiaceæ*, and caoutchouc, or indiarubber, is furnished by a South American tree. The box is the only British tree belonging to this order, the poisonous properties of which it shares.

We will now examine, with caution, our stinging-nettle and our hop. In the former, the stamens and pistils are borne in separate flowers on the same or different plants; in the latter, they occur on different plants. The perianth is persistent. In the stinging-nettle it is four-cleft; in the hop five-cleft. In both cases, the stamens are equal in number to the lobes of the perianth and opposite them, and the anthers are curved inwards in the bud. Take a needle, and touch one which has not emerged; it will burst with elasticity, scattering its pollen. The fruit is a dry, one-seeded capsule. These are the marks of *Urticaceæ*, the *nettle tribe*, which contains, among other interesting plants, the bread-fruit, fig, mulberry, the Upas, or poison-tree, of Java, and the cow-tree of Demerara. Nettle-tea is used to purify the blood, and on the Continent the young tops are eaten as a vegetable.

We can now prepare our fourth coloured wrapper, which must be marked: '*Monochlamydeæ, or Incompletæ:* Dicotyledons with only one floral covering.'

Our first brown paper sheet will contain the goose-foot, and must bear the label: '*Chenopodiaceæ, the goose-foot tribe;* plants with a deeply five-cleft perianth, which finally closes over the single seed, five stamens springing from the base of the ovary, and a superior ovary with a two-cleft style.'

The second sheet will contain four plants: the common knot-grass, sorrel, water-dock, and water-pepper The label must be marked: '*Polygonaceæ, the dock tribe;* plants with alternate leaves, ochreate stipules, a deeply three-six parted perianth, five-eight stamens, springing from the base of the perianth, and a three-cornered, nut-like fruit.

The third sheet will contain the spurge, and must be marked: '*Euphorbiaceæ, the spurge tribe;* plants with

an acrid, corrosive juice, monœcious or diœcious flowers, perianth lobed when present, and a three-celled, three-seeded fruit.'

The fourth sheet will contain the stinging-nettle and hop. It must be labelled: *Urticaceæ, the nettle tribe;* plants with monœcious or diœcious flowers, persistent perianth, stamens equal in number to the lobes of the perianth and opposite them, incurved anthers, fruit a dry, one-seeded capsule.'

Next month we will undertake the consideration of the second great class into which flowering plants are divided, viz., *Monocotyledonæ.*

(*To be continued.*)

—o—

THE 1892 CERTIFICATE EXAMINATION.

BY DR. GEORGE BEACH, M.A.,

Co-Author of 'A Manual of our Mother Tongue,' 'A Girls' Arithmetic,' Author of 'Elements of English,' 'Entertaining Readers,' etc.

I. REMARKS ON ROUTINE :—

FIRST YEAR.

(*a*) Parse fully :—*much, wonderful, cull, thither, afar, sons, spoil, Skilled, dragons, there, high, had witnessed, thus, uncouth, tremendous, curled, Whose, world.* (First Friday.)

(*b*) Parse fully :—*him, That, ever, arrow, First, yeoman, Told, how, shunning, still, At, unawares, him, harm, choicest, can, Then, sly, creeping, on, pierced ;* OR, *answer, which, forth, him, further, thus, What, occupation, pursue, like, you, Ere, But, each, each, drest, phrase, speech, Such, use, men, who, their.* (Third Monday.)

SECOND YEAR.

(*a*) Paraphrase Lines 268 to 283 of Scene 4, Act II. of 'King Lear.' (Third Saturday.)

(*b*) Parse fully :—*why, Thus, out, of, threading, Occasions, Wherein, have, father, he, which, least, hence, friend, bestow, which.* (Fourth Monday.)

(*c*) Paraphrase Lines 112 to 122 of Scene 2, Act II. of 'King Lear.' (Fourth Friday.)

II. BACON'S ANTITHETA.

ESSAY XXI.

FOR.	AGAINST.
1. Fortune often sells to haste what she gives without price to delay.	1. Opportunity gives you first the jug's handle, but afterwards the belly.
2. While we hasten to clasp the beginnings of things we clutch at shadows.	2. Opportunity, like the Sibyl, lowers her offers and raises her prices.
3. While things are wavering, watch ; when they turn, act.	3. Speed is the invisible cap, or the Helmet of Pluto.
4. In actions the beginnings should be intrusted to Argus of the hundred eyes, but the ends to Briareus of the hundred hands.	4. When one acts betimes, one may act like a judge ; but when one is late in action, one must act like a courtier.
5. Dangers more oft beguile than overpower.	5. One teaches danger to advantage by being always on the alert for it ; and one makes to oneself imaginary perils by one's useless safeguards.
6. It is less troublesome to stop and front a danger, than to note and guard against its growth.	6. Even in safeguards against perils, there lurks some touch of peril.
7. Let a danger seem slight, and it is slight no longer.	7. Better have to do with a few perils of long-standing, than with the vain threats of every passing peril.

ESSAY XXIV.

1. All medicines are innovations.	1. New-born creatures are always unshapely.
2. He that shuns new remedies waits for new evils.	2. I would have no founder but time.
3. Time is the greatest innovator ; why, then, should we not imitate him ?	3. There's nothing new that does not do some wrong : for the new patch rends the old coat.
4. As for precedents, ancient ones are inappropriate ; modern are corrupt and selfish.	4. Things that have won their way through custom, even if not good yet fit well together.
5 Leave it to fools and quibblers to regulate their actions by precedent.	5. What innovator succeeds in imitating Time, who so insinuates his innovations that they are imperceptible ?
6. As those who bring honours into a family are commonly more deserving than their descendants ; so are precedents mostly better than imitations.	6. Whatever comes unexpectedly causes less pleasure where it helps, and more displeasure where it harms.
7. A froward retention of custom is as turbulent a thing as an innovation.	
8. Since of themselves things change for the worse ; if by wise counsel we do not change them for the better, what end will there be of evil ?	
9. The slaves of custom are the laughing-stocks of time.	

III. ALGEBRA.

$$\text{(A)}\quad 3x + 4y = 2xy$$
$$\text{(B)}\quad 6z + 5x = 4xz$$
$$\text{(C)}\quad 4y + 3z = 3yz.$$

From (A) $3x - 2xy = -4y$

$$x(3 - 2y) = -4y$$

$$(a)\qquad x = \frac{-4y}{3 - 2y}.$$

From (B) $5x - 4xz = -6z$

$$x(5 - 4z) = -6z$$

$$(b)\qquad x = \frac{-6z}{5 - 4z}.$$

Equating (*a*) and (*b*) and dividing by 2, then

$$\frac{2y}{3 - 2y} = \frac{3z}{5 - 4z}$$
$$10y - 8yz = 9z - 6yz$$
$$10y - 2yz = 9z$$
$$y(10 - 2z) = 9z$$

$$(c)\qquad y = \frac{9z}{10 - 2z}$$

From (C) and substituting the value of y from (*c*)

$$\frac{36z}{10 - 2z} + 3z = \frac{27z^2}{10 - 2z}$$
$$36z + 30z - 6z^2 = 27z^2$$
$$36 + 30 - 6z = 27z$$
$$66 = 33z$$
$$z = 2. \quad \text{Ans.}$$

The values of x and y are now easily obtained.

Find the length of a floor 18 *feet wide ; the difference of cost if covered with asphalt,* 2 *inches deep, at* 18*s. per cubic yard, or with gravel* 6 *inches deep at* 2*s. per cubic yard amounting to* £6.

Let x = length in yards ; £6 = 120s.

(*a*) Cubical content of Gravel in c. yards $= 6x \times \frac{1}{2} = 3x$

$\therefore$ Cost of Gravel in shillings $= 3x \times 2 = 6x$

(*b*) Cubical content of Asphalt in c. yards $= 6x \times \frac{1}{6} = x$

$\therefore$ Cost of Asphalt in shillings $= x \times 18 = 18x$

$\therefore$ Equating (*a*) and (*b*) from question

$$6x + 120 = 18x$$
$$12x = 120$$
$$x = 10. \quad \text{Ans.}$$

Show that if n be any integer $n(n^2-1)(n^2-4)$ *is divisible by* 120.

$$\frac{n(n^2-1)(n^2-4)}{120} = \frac{n(n+1)(n-1)(n+2)(n-2)}{120}$$

$$= \frac{(n+2)(n+1)(n)(n-1)(n-2)}{5\times4\times3\times2\times1}.$$

Now it is evident that $(n+2)(n+1)(n)(n-1)(n-2)$ represents the product of any five consecutive numbers; also that the product of any five consecutive numbers will divide by 5, 4, 3, 2, and 1. Q.E.D.

The product of any n consecutive numbers will divide by factorial n. $(\lfloor n)$.

Similar exercises.—

(*a*) $n(n^2-1)(n^2-4)(n^2-9)$ will divide by 5040.
(*b*) $n(n^2-1)(n^2-4)(n^2-9)(n^2-16)$ will divide by 362880.
(*c*) $n(n^2-1)(n^2-4)(n^2-9)(n^2-16)(n^2-25)$ will divide by 39916800.

IV. Grammatical Peculiarities of 'King Lear,' (compiled chiefly from 'Abbott's Shakesperian Grammar.')

Adjective as Adverb.

'I should be *false* persuaded.' I., iv., 232.
'*Horrible* steep.' IV., vi., 3.

Adjective used as Verb.

'I'll *able* 'em.' IV., vi., 172.
'France invades our land. Not *bolds* the king' V., i., 26.

Double Comparative.

'My love's *more richer* than my tongue.' I., i, 80.
'To avert your liking a *more worthier* way.' I., i., 214.
Also II., ii., 155; II., iv., 111; III., ii., 64.

Adjective with ancient active meaning.

'Who I am sure is kind and *comfortable*.' I., iv., 328.

-est instead of most.

Contemned'st wretches. II., ii., 150.

Possessive Adjectives transposed.

'Gracious *my* lord, hard by here is a hovel.' III., ii., 61.

Adverbs with prefix 'a.'

'Keep in *a-door*.' I., iv., 138.
'Bite the holy cords *a-twain*.' II., ii., 80.
Also III., iv., 59; III., v., 8; IV., vi., 58; V., iii., 274.

Adverb used as Noun.

'Thou losest *here*, a better *where* to find.' I., i., 264.
'From the extremest upward of thy head.' V, iii., 136.

'*The*' *omitted.*

'[They] are at ∧ point.' III., i., 33.
'At ∧ gate.' III., vii., 17.

'*The*' *used to* '*nounalise*.'

(*a*) *Gerunds* 'In *the* restoring his bereaved sense.' IV., iv., 9,
(*b*) *Relatives* '*The* which he lacks.' IV., iv., 13.

'*The*' *used Adverbially modifying the comparative.*

'*The* better.' II., i., 14.

'*And*' *intensive.*

'Return to her, *and* fifty men dismissed.' II., iv., 210.
'He that has *and* a little tiny wet. III., ii., 74.

'*And*' or '*an*' (= *if*) '*An* thou canst as the wind sets, thou'lt catch cold.' I., iv., 112.

'*As*' (= as if) 'Is it not *as* this mouth should tear this hand.' III., iv., 15.

'*As*' *omitted.*

'Commit a thing so monstrous ∧ to dismantle.' I., i., 220.

'*As*' *used as Relative Pronoun.*

'I am made as that self metal *as* my sister.' I., i., 71.
'Such a tongue, *As* I am glad I have not.' I., i., 235.

Uses and position of '*but*.'

= *than* 'Unaccommodated man is no more but such a poor animal as thou art.' III., iv., 112.
= *yet* 'Made you my guardians, my depositaries,
But kept a reservation.' II., iv., 255.
= *only* 'Bring me *but* to the very brink of it.' IV., i., 78.
= *that not* 'There's not a nose among twenty, but can smell him that's stinking.' II., iv., 72.
= *that not* 'There was never yet fair woman, but she made mouths.' III., ii., 36.

Uses of '*of*.'

= *in* 'Your business *of* the world hath so an end.' V., i., 45.
= *concerning* 'He shall never more
Be feared *of* doing harm.' II., i., 113.
= *about* 'Well informed *of* them.' II., i., 104.
(*redundant*) 'Here stood he mumbling *of* wicked charms. II., i., 41.
(*redundant*) 'Did my father strike his gentlemen for chiding *of* his fool?' I., iii., 1.
= *by* 'Known *of* thee.' II., ii., 28.
= *between* 'Difference *of* man and man.' IV., ii., 26.
= *for* 'Pity *of* them.' IV., vii., 31.

Uses of '*on*.'

= *of* 'The middle on's face.' IV., v., 20.
= *of* (Partitive) 'This fellow has banished two on's daughters.' IV., i., 52.

Uses of '*to*.'

= *as regards* 'Few words, but *to* effect, more than all yet.' III., i., 52.'
= *on* 'Bestow
Your needful counsel *to* our business.' II., i., 128
= *in, according to* 'To my judgement.' I., IV., 62.
= *for* 'I advise you *to* the best' I., ii., 188
= *against* 'Bending his sword *to* his great master.' IV., ii., 75.
= *by way of* '*To boot*.' IV., vi., 229.
(*omitted*) 'List ∧ a brief tale.' V., iii., 181.

Uses of '*upon*.'

= *against* 'I have overheard a plot of death *upon* him.' III., vi., 96.
= *for on behalf of*, 'Have you nothing said.
Upon his party? II., i., 28.

Preposition omitted.

by 'Thou swear'st ∧ thy gods in vain.' I., i., 163.
at 'Smile you ∧ my speeches?' II., ii., 88
of 'Deprived ∧ that benefit.' IV., vi., 61.

The references in each case are to the Globe Shakespeare; but the acts and scenes are, of course, the same in every modern edition, and the numbering of the lines will be in close correspondence.

(*To be continued.*)

V. Mental Arithmetic Paper.

(*Twenty minutes allowed for this paper.*)

1. 25 cwt. 25 lbs. reduced to lbs = ( )
2. The mean proportional between 336 and 525 = ( )
3. $(26)^3 - (25)^3$ = ( )
4. 2s. 7½d. expressed as decimal of 9s. 2½d. = ( )
5. $\sqrt{22\frac{9}{16}} \div \cdot04$ = the mixed number ( )
6. 3 cwt. 1 qr. 8lbs. at 16s. 4d. per cwt. = ( )
7. Income from investment at 4¼ per cent. is £212 10s. Then the investment must = ( )
8. A man's income is £466 13s. 4d. He spends 87½ per cent. of it. His savings = ( )
9. A, B, and C invested £620, £760, and £1,100 in a business. A year's profits are £266 18s. 6d. Therefore A's share of the profits = ( )
10. $\cdot\dot{6}\dot{9} \times \cdot\dot{6}\dot{9}$ as a vulgar fraction in lowest terms = ( )
11. 384 articles at 4s. 9½d. each = ( )
12. Simple Interest on £145 1s. 6d. for three years at 4½ per cent. per annum = ( )
13. When income tax is 9d. in the £, a man's net income is £462 19s. 3d, When 6d. in the £ is the income tax, his net income = ( )
14. True discount on £171 4s. 9d. due 3½ years hence at 4 per cent. per annum simple interest = ( )

Answers (1) 2,825 lbs; (2) 420; (3) 1951; (4) $\cdot285714$; (5) $23\frac{1}{8}$; (6) £2 14s. 3d.; (7) £5,000; (8) £105 3s.; (9) £66 14s. 7½d; (10) $\frac{1}{180}$; (11) £92; (12) £18 2s. 8½d.; (13) £468 19s. 6d.; (14) £21 0s. 7d.

CERTIFICATE ROUTINE FOR AUGUST, 1892 (MEN AND WOMEN, SECOND YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	Jevons' Logic, pp. 22 to 37	Read 'King Lear,' Act II.	Euclid, Book VI., first 8 Props. *or* Practise Darning	School Registers	Read Cantos V. and VI. of 'Last Minstrel,' *or* Trench, Lecture V.	Euclid, Book VI., first 17 Props. *or* Tucking, Whipping, Feather-Stitching	Notes of a Lesson on 'The Eye: its structure and uses.	Deductions on Euclid, Book VI. *or* Linen Patch	Paraphrase Lines 236 to 251 of 'King Lear,' Act I., Scene 4	'Herbert Spencer' pp. 56 to 74 *or* 'Locke,' Sections 174 to 187	Euclid, Book II. *or* Print Patch	Analyse Lines 118 to 128 of 'King Lear,' Act II., Scene 1. Parse difficult words
TUESDAY	Chief Dates from 1066 to 1153 *or* History from 1789 to 1802	Mensuration *or* Stocks	As in First Year *or* Railroads of North America	History from 1649 to 1684 *or* From 1808 to 1815	Race Problems	As in First Year *or* Geography of Mexico	Chief Dates from 1153 to 1258 *or* European Campaigns from 1789 to 1820	Mental Arithmetic	As in First Year *or* Geography of British North America	History from 1684 to 1702 *or* Irish Affairs from 1789 to 1820	Theory of Proportion	As in First Year *or* Governments of North America
WEDNESDAY	Read 'King Lear,' Act III.	Simultaneous Simple Equations *or* Food for the Sick	'Long Tots,' their use, and how to teach them.	Read 'Bacon's Essays' 1, 2, 4, 5, *or* Notes on 'King Lear'	'Herbert Spencer' pp. 38 to 56 *or* 'Locke,' Sections 167 to 173	The Algebraic Progressions, *or* Apportionment of Small Incomes	Mensuration *or* Any Revision	Jevons' Logic, pp. 37 to 53	Algebraic Interest *or* Best time to purcha e Household Requisites	Jevons' Logic, pp. 53 to 69	Algebraic Annuities *or* Disinfectants	Any Revision
THURSDAY	History from 1714 to 1745 *or* From 1802 to 1808	Compound Proportion	As in First Year *or* Chief Cities of North America	History from 1745 to 1775 *or* From 1815 to 1820	Compound Interest	As in First Year *or* Settlement of North America	History from 1775 to 1795 *or* European Cam aigns from 1789 to 1820	Problems of different agents (A, B, C, etc.) and of running taps	As in First Year *or* Manufactures of North America	History from 1795 to 1815 *or* Scotch Affairs from 1789 to 1820	Stocks	As in First Yea *or* Taxation, Education, Army, Navy, of North America
FRIDAY	Binomial Theorem *or* Nourishing Food for Convalescents	Deductions on Euclid, Book I. *or* Diagram of Muslin Pinafore	The Educational value of Drawing, and its relation to Writing.	Permutations *or* Benefit Clubs, Building Societies, etc.	Deductions on Euclid, Book II. *or* Cut ing-out of Muslin Pinafore	Mensuration *or* Any Revision	Combinations *or* Slight Wounds and Accidents	Euclid, Books II. and IV. *or* Give the measurements of the required garments	Read 'Bacon's Essays,' 9, 11, 14, and 15 *or* Notes on 'King Lear'	Mensuration *or* Infection and Contagion	Principles of Euclid, Book V. *or* Describe how to cut out a Boy's Shirt	Paraphrasing (see Article)
SATURDAY	Map of Midland Counties *or* Quebec and Ontario	Penmanship	Peculiarities of Shakespearean Grammar	Describe the characters of Burgundy, Cornwall, Albany, and Oswald	Map of Wales *or* Nova Scotia and New Brunswick	Mensuration *or* Division into Proportional Parts	Historical Dates *or* Any Arithmetic	Repetition, Literature, and Penmanship	Map of India *or* Manitoba and British Columbia	Any Revision	Study of Code	Paraphrasing (see Article)	Penmanship	Mensuration *or* Any Revision	Recitation	Repetition, Literature, and Penmanship

CERTIFICATE ROUTINE FOR **AUGUST**, 1892 (MEN AND WOMEN, FIRST YEAR).

DAYS	FIRST WEEK.			SECOND WEEK.			THIRD WEEK.			FOURTH WEEK.		
	I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
MONDAY	The effective range of Corporal Punishment and Detention	Read 'Lay of Last Minstrel,' Canto VI., *or* 'Resolution and Independence'	Euclid, Book III., Props. 1 to 8, *or* Cost of Clothing	How to secure Good Repetition	Study Notes to 'Lay of Last Minstrel,' *or* 'Resolution and Independence'	Euclid, Book III., Props. 9 to 15, *or* Composition and Use of Air	Notes of a Lesson on Subordinate Sentences	Analyse Lines 156 to 169 of Canto VI. of 'Lay of Last Minstrel,' *or* Lines 85 to 98 of 'Resolution and Independence.' Parse difficult words	Euclid, Book III., Props. 16 to 24, *or* 'Functions of Food'	How to develop 'Observation'	Read Bacon's Essays, XI., XIV., XV., XVI., XVII., *or* Study Grammar from Text-book	Euclid, Book I., Props. 1 to 16, *or* Functions of Clothing
TUESDAY	Chief Dates from 1135 to 1189	Harmonical Progression, *or* Repair of Underclothing	Scattered Possessions of Britain, *or* Central Africa	Chief Dates from 1189 to 1216	Evolution of Algebra, *or* Diagram of a Woman's Chemise	Winds, Currents, and Tides	Poetry from 1789 to 1815 *or* Lives of Great Men from 1270 to 1376	Algebraic Surds, *or* Any Needlework	Geography of India, *or* Physical Geography of Africa	Chief Dates from 1216 to 1307	Variation and Arithmetical Progression, *or* Practice Needlework	Geography of West Indies, *or* Egypt
WEDNESDAY	Present Worth and Discount, *or* Practice	Recitation and Penmanship	Equation of Payments, *or* Simple Proportion	Stocks, *or* Compound Proportion	Any Revision	Stocks, *or* Percentages	Any Revision, *or* Notes on 'Burke's Reflections'	Problems on Mixed Agents	Problems of Motion (Arithmetic)	Clock Sums	Any School Management	Recitation and Penmanship
THURSDAY	History from 1689 to 1702, *or* Dynastic Tables	Involution of Algebra, *or* Drainage and Water Supply	Extent, Population, and Productions of our Empire *or* European Possessions in Africa	History from 1066 to 1135	Algebraic Fractions, *or* Composition and Nutritive Value of Food	Causes which affect Climate	Constitutional Affairs from 1660 to 1775	Ratio and Proportion of Algebra, *or* Materials of Clothing	British Possessions in Asia, except India, *or* Political Geography of Africa	History from 1135 to 1216	Simple Equations, *or* Furnishing the Home	Political Geography of British North America *or* Cape Colony
FRIDAY	Deception of the Senses	Deductions of Euclid, Book III., *or* Cutting-out of a Pair of Drawers	Analyse lines 322 to 339 of Canto VI., 'Lay of Last Minstrel,' and Parse difficult words, *or* study 'Burke's Reflections' page 84 to 116	Mensuration, *or* Fractions	Briefly write out the substance of Canto VI., 'Lay of Last Minstrel,' *or* 'Resolution and Independence'	Rules for Teaching Elementary Freehand Drawing	The Principles of a School Routine and Classification	Euclid, Book II., *or* Furnishing of the Home	Read Bacon's Essays, I., II., IV., V., IX., *or* 'Burke's Reflections,' pp. 116 to 150	How to illustrate Geography from the Scholars' Surroundings	Race Problems	Read Bacon's Essays, XVIII., XIX., XXI., XXIV., XXV., *or* 'Burke's Reflections,' pp. 150 to 183
SATURDAY	Map of Midland Counties, *or* Africa	Penmanship	Grammar from Text-books	Deductions of Euclid, Book I., *or* Construction of the Home	Map of Wales, *or* Egypt	Simultaneous Simple Equations *or* Recitation	Any Mensuration *or* Arithmetic	Deductions of Euclid, Book II., *or* Repair of Underclothing	Map of India, *or* South Africa	Deductions of Euclid, Book III., *or* Diagram of an Infant's Shirt	Quadratic Equations, *or* Recitation	Composition on 'Discretion is the better part of valour'	Penmanship	Map of New Zealand *or* Cape Colony	Simultaneous Quadratics, *or* Recitation	Composition on 'Uneasy lies the head that wears a crown'

SELECTED GOVERNMENT QUESTIONS.

FIRST YEAR.

SECOND WEEK.

1. Write in large hand the words '*Spontaneously Fertile.*'
Write in small hand the words '*Panoply is a complete armouring.*'

2. Write from Dictation :—

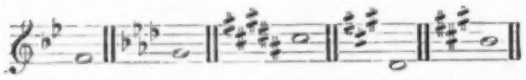
'Classical antiquity has one quality of supreme importance from a pedagogic point of view—it is not romantic. There is no risk of developing a wandering imagination straying in pursuit of chimeras or lost in vacuous reveries; there is no danger of factitious sentimentality. Transporting the young into surroundings different from their own, it prevents them from becoming prematurely familiar with that side of modern literature which is too impassioned, too enervating, and too exciting.'

3. It is said in the *Instructions to Inspectors* that 'it is of little service to adopt the *gifts* and mechanical occupations of the *Kindergarten*, unless they are so used as to furnish real training in accuracy of hand and eye, in intelligence and obedience.' Discuss this statement and the reasons for it.

4. Draw up full notes of a lesson on one of these subjects—
(*a*) Westminster Abbey.
(*b*) *For Infants*—The number Twelve.
(*c*) Adjectives and Adverbs.

5. Write above (*a*) F, B♭, C♯, A♭ a perfect or major fourth, and (*b*) B, D♭, F♯, E♭, a minor seventh; OR, name (as major sixth, etc.) the following intervals:—
(*a*) m—d' (*b*) r—s (*c*) t_1—l (*d*) f—t
(*e*) l_1—s (*f*) m—t (*g*) ta—r' (*h*) m—fe.

6. State the relation (as tonic, mediant, subdominant, etc.) of the following notes:—



OR

Re-arrange the following notes in order of pitch, placing the highest note first in each case:—
(*a*) s d fe l t_1 d' m ta r' f r m'.
(*b*) d s_1 r f_1 fe ta m l_1 s d'.

7. Write such notes as you think needful on the following passages—

(*Men only.*) Travel, in the younger sort, is a part of education; in the elder a part of experience. He that travelleth into a country before he hath some entrance into the language, goeth to school and not to travel. That young men travel under some tutor or grave servant, I allow well; so that he be such a one that hath the language.

(*Women only.*) The National Assembly of France has given some importance to these gentlemen by adopting them; and they return the favour by acting as a Committee in England for extending the principles of the National Assembly. Henceforward we must consider them as a kind of privileged persons, as no inconsiderable members in the diplomatic body.

8. (*Men only.*) Give a short analysis of the Essay on 'Studies.' Explain the enigma 'Daylight is ever the best.'

(*Women only.*) Briefly write down the substance of Burke's remarks upon the *principles* to be found in the 'Declaration of Right.'

9. How is rain formed? Account for there being in some places an excessive, and in others a deficient rainfall, and give examples of each.

10. Draw a Map of Bay of Bengal, OR of Tropical Africa.

11. (*Men only.*) Why is it necessary that our coaling stations should be fortified? Enumerate the chief coaling stations belonging to Britain in the Eastern Hemisphere, and give an account of one of them.

(*Women only.*) From what parts of Africa do we import ivory, palm oil, diamonds, ostrich feathers, wheat, wine, and gold?

12. Discuss the claims of Balliol and Bruce to the Scottish Throne. On what grounds was the decision referred to Edward I.?

13. (*Men only.*) Give the substance of the '*Petition of Right.*' How was it received by the king?

(*Women only.*) What were the chief articles in the impeachment of Warren Hastings? How was the government of India administered in the 18th century?

14. If £40 be due at the end of 6 months, £60 at the end of 12 months, and £80 at the end of 15 months, what is the equated time for paying the whole? Ans. 12 months.

15. If I transfer £1,000 from the Three per Cents. at 92, to a 4 per cent. Stock, and gain £1¼ income, find the price of the latter stock. Ans. £117½.

16. (*Men only.*) Find the diameter of a circle described round a triangle whose sides are 293, 285, 68. Ans. 293.
(*Women only.*) Describe the putting on of a print patch.

17. (*Men only.*) The radius of a circle is one foot. Find the area of a regular polygon of eight sides inscribed in the circle.
Ans. $2\sqrt{2}$ sq. feet.

(*Women only.*) How would you work the following sum before a class of children who have already had some lessons on Stocks :—'Which is the better investment, a 2½ per cent. Stock at 97½, or a 4 per cent. Stock at 130?' Ans. The latter.

18. (*Men only.*) A person rents a certain number of acres of pasture land for £70. He keeps 8 acres in his own possession, and sublets the remainder at 5s. per acre more than he gave. By this he gains £2 besides his rent. How many acres were there?
Ans. 56 acres.

(*Women only.*) What are the relative values of vegetable and animal food in maintaining the body in health. Name a few of the most useful articles of each class of food.

19. (*Men only.*) Show that if the number 4 be divided into any two parts, their products is less than 4 by the square of half their difference.

(*Women only.*) Name the staple materials of clothing in use among the labouring class. Give some account of each, and of its special value

20. (*Men only.*) If two triangles have two angles of the one equal to two angles of the other, each to each, and one side equal to one side, these sides being opposite to equal angles in each, then shall the other sides be equal each to each, and also the third angle of the one equal to the third angle of the other.

(*Women only*) What is *draining* as applied to a house? Explain what is meant by defective draining, and show its danger.

21. (*Men only.*) Draw a line cutting two concentric circles, so that the part of it intercepted by the circumference of the greater may be double the part intercepted by that of the less.

FIRST YEAR.

FOURTH WEEK.

1. Write in large hand the words, '*Incomparably blessed.*'
Write in small hand the words,

'*I sparkle out among the fern,*
To bicker down the valley.'

2. Write from dictation :—

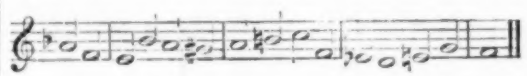
'Every conscious act, every thought, every sentiment, presupposes an imperfection, a delay, a check, a want of organisation, and therefore our ideal of typical human perfection must be that of an unconscious automaton marvellously complicated and unified. Now such an existence implies cessation of progress, and is neither admissible from the scientific, nor desirable from the practical point of view. Hence the real ideal for man is not the permanent adaptation to his environment, which would issue in automatism, but an increasing faculty of re-adaptation.'

3. In grouping together a large number of words, having in them a common element, *e.g.*, words ending in '*-tion*,' what generalization could be made, and how far could the scholars be helped to make this generalization for themselves? Show the value of such an exercise.

4. Take the following extract, and say (*a*) what words in it would need special explanation; and (*b*) how you could illustrate from it the difference between literal and metaphorical language :—

'How gloriously her gallant course she goes!
Her white wings flying never from her foes,
She walks the water like a thing of life,
And seems to dare the elements to strife.
Who would not brave the battle-fire, the wreck,
To move the monarch of her peopled deck?'

5. Transpose the following a minor third lower, namely, into the key of D.



OR

Which of the following notes is highest in pitch, and which is lowest:—

(*a*) t_1 in key C. (*d*) **f** in key B♭.
(*b*) **r** „ „ A. (*e*) l_1 „ „ E♭.
(*c*) **s** „ „ D. (*f*) **m** „ „ G.

6. State the meaning of the following terms:—(*a*) Molto, (*b*) Sempre, (*c*) Sostenuto, (*d*) Tempo primo, (*e*) Con moto, (*f*) Con brio.

7. Cull instances of the various 'figures of speech' from 'Lay of Last Minstrel' or Wordsworth's poems.

8. (*Men only.*)

(*a*) Certain discoursing wits.
(*b*) An ejaculation or irradiation of the eye.
(*c*) By indignities men come to dignities.
(*d*) A man's nature is best perceived in privateness.
(*e*) To be master of the sea is an abridgment of a monarchy.
(*f*) Votary resolution is made equipollent to custom.

(*Women only.*)

(*a*) These gentlemen of the Old Jewry.
(*b*) Privilegium non transit in exemplum.
(*c*) Repeating as from a rubric.
(*d*) The heir per capita, or the heir per stirpes.
(*e*) Habeas Corpus.
(*f*) Sophisters.

Explain the above words or phrases.

9. What is the effect of climate on the industry and productions of the tropical countries, and on the character of the races inhabiting them? Account for the difference of climate between Sierra Leone and Cape Colony.

10. Draw a Map of New Zealand OR of the Niger.

11. (*Men only.*) Describe fully the constitution of a Crown Colony. Name six of the chief Crown Colonies.

(*Women only*) Write notes of a lesson for an advanced class upon 'The mixture of races in Cape Colony.'

12. Recall the chief terms of the '*Treaty of Paris*' (1763).

13. (*Men only.*) Mention some of the most remarkable contrasts brought out by a comparison of the condition and habits of the English people in the seventeenth century and at the present time.

(*Women only.*) *The Elizabethan age forms one of the most brilliant periods in the history of English literature.*

Illustrate this statement.

14. In a day 4 Englishmen can do as much work as 5 Frenchmen, and 4 Frenchmen as much as 7 Zulus. It is found that 13 English and 12 French can finish an undertaking in 3 days. How long will it take 10 Zulus? Ans. 14·831 days.

15. A and B can do a piece of work in $3\frac{3}{7}$ hours, B and C in $3\frac{3}{4}$ hours, A, B and C in $2\frac{4}{11}$ hours. If A and B work for 2 hours, how long will A and C take to finish it? Ans. $1\frac{1}{2}$ hours.

16. (*Men only.*) Find the area of a regular polygon of 24 sides inscribed in a circle, the radius of which is 1 foot. Ans. 3·10584.

(*Women only.*) Describe the putting-on of a flannel patch.

17. (*Men only.*) The sides of a triangle are 13, 14, and 15 feet. Find the perpendicular upon the opposite angle on the side of 14 feet. Ans. 12 feet.

(*Women only.*) Prove the rule for converting $\cdot\dot{3}\dot{6}$ into its equivalent vulgar fraction. Ans. $\frac{4}{11}$.

Explain addition of repeaters without converting them into vulgar fractions.

18. (*Men only.*) For what value of x is the expression $x^4 + 6x^3 + 11x^2 + 3x + 31$ a perfect square? Ans. $x = 10$.

(*Women only.*) There has grown up of late a considerable feeling against *dyed*, and in favour of *natural* wool. Explain why this is, and state your own opinion on the matter.

19. (*Men only.*) The sum of two numbers multiplied by the greater is 84; their difference multiplied by the less is 10. Find them. Ans. 7 and 5; or $6\sqrt{2}$ and $\sqrt{2}$.

(*Women only.*) Would you advise a young woman to buy ready-made clothing or to make her own clothes wholly or in part? Give your reasons.

20. (*Men only.*) The sides PQ, PR of the triangle PQR are produced to S and T. QV, RV bisect the angles SQR, TRQ, show that PV bisects the angle QPR.

(*Women only.*) Define what is meant by pure air, and show, from the nature of our bodies, the need of a constant supply.

21 (*Men only.*) If a straight line drawn through the centre of a circle bisect a straight line in it which does not pass through the centre, it shall cut it at right angles; and conversely, if it cut it at right angles, it shall bisect it.

SECOND YEAR.

Second Week.

1. As in First Year.

2. As in First Year.

3. Make a Time Table for a Mixed School, in a suburban district, of 200 scholars, including an Infant Class.

4. Question 3, of Fourth Week in July (First Year).

5. As in First Year.

6. As in First Year.

7. For what purposes does Shakespeare employ rhyme? Give instances.

8. (*Men only.*) As in First Year, Fourth Week.

(*Women only.*) '*What would have needed a sentence is accomplished by a word.*' Give illustrations of this remark from Trench.

9. (*Men only.*) As in First Year.

(*Women only.*) Describe *one* of the North-American trans-continental railways.

10. (*Men only.*) As in First Year.

(*Women only.*) What are the physical features of Central America? Enumerate also the chief productions.

11. (*Men only.*) As in First Year.

(*Women only.*) Where and what are *Hooker*, *Regina*, *Juan de Fuca*, *Canso*, *Mobile*, *Grande del Norte*, *Conception*, and *Popocatapetl*?

12. (*Men only.*) As in First Year.

(*Women only.*) What do you know of '*Peterloo*' and the '*Whip with Six Strings*'?

13. (*Men only.*) As in First Year.

(*Women only.*) Trace shortly the growing influence of the Press as a power in politics in the reign of George III.

14. (*Men only.*) A man saves £ p a year from his income, which he invests annually at r per cent. compound interest. At the end of how many years will he have accumulated a capital, the interest of which is equal to his yearly saving?

Ans. Log. 2. $\div$ Log. $\frac{100 + r}{100}$.

(*Women only.*) Make and stitch a band of calico. Also make and set on a muslin frill.

15. (*Men only.*) Two numbers end with the same digit, and when divided by 7, the quotient of each is the remainder of the other; the sum of these is also 7. Find the numbers. Ans. 13 and 43.

(*Women only.*) Mention the chief contemporary authorities for the history of 1789 to 1820, and also any works of fiction that illustrate that history.

16. (*Men only.*) If a 12 lb. shot has a diameter of 4·4 inches, find the weight of a shot, the diameter of which is 3·96 inches. Ans. 8·748 lbs.

(*Women only.*) As in First Year, Question 17.

17. The difference between the simple and compound interest on a sum of money for 3 years, at 5 per cent. per annum, is £9 6s. 9¾d. Find the sum. Ans. £1,225.

18. (*Men only.*) MNP and MNQ are equal triangles, MQ and NP intersect in R. Through R a straight line is drawn parallel to MN, meeting MP in T and NQ in V. Show that TR is equal to RV.

(*Women only.*) Give heads of general principles to be taught to a cookery class, as preparatory to their practical application.

19. (*Men only.*) As in First Year, Question 21.

(*Women only.*) What are the principal constituents of bread? Distinguish the different kinds of flour. Add any remarks on short weight.

20. State the meanings of the following terms:—(1) Prestissimo, (2) Dal Segno, (3) Legato, (4) Grazioso, (5) Lente, (6) $\mathcal{J}$ = M.50.

SECOND YEAR.

FOUR H WEEK.

1. As in First Year.

2. As in First Year.

3. Some 'alternative courses' in Grammar and Geography are given in the Schedule attached to this year's Code. Describe them, and say which of them you would prefer to adopt, and why?

4. Spencer says:—'*Hardly any parents, and but few tutors, know anything about Psychology.*' What are his further remarks upon this text? OR, What are Locke's remark's upon the '*Volatility of children.*'

5. As in First Year.

6. As in First Year.

7. Paraphrase Lines 205 to 219 of Scene 3, Act V. of 'King Lear.'

8. (*Men only.*) Who were Tacitus, Machiavel, Epimetheus, Prometheus, Galba, and Epicurus?

(*Women only.*) Contrast the characters of Cordelia and Edmund.

9. (*Men only.*) As in First Year.

(*Women only.*) Where in North America are the inhabitants of the Chinese, African, French, Dutch, and Spanish races?

10. (*Men only.*) As in First Year.

(*Women only.*) Draw a Map of Hudson's Bay and the surrounding districts.

11. (*Men only.*) As in First Year.

(*Women only.*) Whence in North America are tobacco, mahogany, gold, oranges, quicksilver, sulphur, salt, and petroleum obtained?

12. (*Men only.*) As in First Year.

(*Women only.*) Sketch the condition of Ireland from 1789 to 1820.

13. (*Men only.*) As in First Year.

(*Women only.*) Give a brief account of the Peninsular War

14. (*Men only.*) The ten's digit of a number is less by 2 than the unit's digit; and if the digits are transposed, the new number is to the former as 7 : 4. Ans. 24.

(*Women only.*) Who were the authors of the following works:—*Childe Harold*, *Queen Mab*, *Sartor Resartus*, *Endymion*, *Essays of Elia*, and *The Talisman?*

15. (*Men only.*) Write down the 5th term in the expansion of $(2 + x)^7$, and find the greatest term when $x = 3$.

Ans. $280x^4$; The eighth.

(*Women only.*) What are the commonest faults to be guarded against in knitting a stocking heel?

16. (*Men only.*) The weights of two globes are as 9 to 25; the weights of a cubic inch of the substances are as 15 to 9; compare the diameters of the globes. Ans. As 3 : 5.

(*Women only.*) As in First Year, Question 17.

17. How many lbs. of tobacco at 5s. 3d. per lb. must a tobacconist mix with 4 lbs. at 6s. 6d. per lb. that he may sell the mixture at 7s. 10d. per lb. and gain ⅓ of his outlay?

Ans. 4 lbs.

18. (*Men only.*) Compare the area of the regular hexagons described in and about a circle.

(*Women only.*) Mention the ordinary causes of the beginning of fevers, and explain the practice of *isolating* infectious cases.

19. (*Men only.*) As in First Year, Question 21.

(*Women only.*) Describe the present facilities for investing small sums of money, mentioning both interest and security. Give instances of investments to be avoided on the ground of *Risk*.

20. What is the easy range of (*a*) Soprano, and (*b*) Bass voices?

CORRESPONDENCE.

We shall be pleased to reply briefly and through these columns to anyone seeking examinational information and advice.

This privilege does not, of course, extend to furnishing the solutions and answers of problems. All such communications should be addressed to 'THE QUERY EDITOR.'

Replies demanding urgency will be promptly forwarded per post on receipt of a stamped and addressed envelope. A post will be saved by writing direct to DR. GEORGE BEACH, M.A. *(Examination Editor of Practical Teacher)*, STANLEY MOUNT, MACCLESFIELD.

J. O. (Montreal).—Inspectors of Schools in England are appointed by patronage, and not selected according to merit.

COLONIA (Blayney, New South Wales).—Professor Skeat's Dictionary and Chambers's Encyclopædia, unless you wish to get very expensive works. Many thanks for kind expressions.

S. T. (Alnwick).—Shading and Freehand both.

'TUT' (Egremont).—The Cheshire County Council will probably continue the classes.

'CLAVE.' (Bilston).—Read paragraph 47 of Instructions to Inspectors.

G. B. (Pontefract).—You have been victimised, but I see no remedy.

M. J. (Whitby).—There is no means of your getting a Certificate, except in the ordinary way you mention.

S. M. (Leicester).—Your request simply amounts to asking from us a gratuitous advertisement.

——(Glasgow).—We are not concerned in the question. The more teachers who are possessed of a respectable degree, the better we shall be pleased.

R. N. (Oldbury).—H.M.I. will hear you read and recite.

'LA BELLE' (St. Heliers).—1. French will be accepted. 2. 'La Jeune Sibérienne.'

J. U. (Leeds).—Chambers's Encyclopædia is just issuing afresh.

S. P. (Harrogate).—Macmillan's.

P. R. (Goole).—Get an illustrated drawing syllabus. The pentagon is required for Standard III.

'TOP' (Smethwick).—Join the N.U.T.

B. J. (Northampton).—Stick to your last, and be thankful; the profession is overcrowded. Many certificated and trained teachers are not getting 30s. per week.

H. S. (Hanley).—Female Assistants may be employed in Boys' Schools.

K. H. (Ayr).—According to ability and attainments, certainly not with regard to age.

T. R. (Leamington).—You need (we say so unhesitatingly) another assistant.

'MINE' (Durham).—Officialism, not politics, is to blame. If Dr. Talbot had been properly reprobated at Leeds, Sir W. Hart-Dyke would never have dared to utter such obsolete Toryism.

E. H. H. (Stapenhill); F. B. (Birmingham); R. O. (Stafford); D. J. (Brecon); S. H. (Douglas).—Correct.

S. T. (Leominster).—You will find solution in article this month.

R. B. (Stansfield).—'Blessed are ye when men shall revile you,' etc.

W. P. (Stockport).—There is no such book. It would not sell.

S. H. (Hagley).—Only as 'a woman over eighteen.'

'TALC' (Perth).—Cartwright's Mental Science and Logic for Teachers; price 2s. 6d., Hughes and Co.

B. R. (Dudley).—No.

LETTERS ANSWERED BY ORDINARY POST.—

P. T. R. (Congleton); J. M. (Draycott); S. T. (Middlewick); W. M. (Falmouth); S. J. (Middlesborough); 'MAC' (Bermondsey); D. C. E. (Wrexham); A. B. (Shipley); D. L. (Southsea); G. N. (Liskeard); G. E. H. (Plasmarl); R. M. (Christchurch); T. U. B. (Brixton); E. D. (Pemberton); J. T. (Eccles); P. Z. (Marlborough); H. J. M. (Selby); 'TRUNION' (Portsmouth); C. T. T. (Perth); A. M. (Glasgow); C. T. T. (Thirsk); F. J. H. (Acton); H. A. J. (Stalybridge); J. K. (Exeter); 'FIZ' (Wolverhampton); W. R. C. (Leeds); E. M. L. (Yarmouth); A. S. (Bradford); U. T. (Ripon); L. C. (Hoole); H. E. N. (New Ferry); 'TAILOR' (Nottingham); B. G. (Congleton); W. (Beith, Scotland); T. W. B. (Stone); '5' (Warwick); C. C. (Darlaston); G. R. R. (Coventry); 'ABERLEY' (Kidderminster); S. B. (Adbaston); J. H. (Folkestone); B. O. (St. Ann's); W. P. W. (Mineva); 'W.' (Chesterfield); E. E. C. (Darlington); A. E. A. (King's Lynn); W. J. (Castleford); PRO BONO (Stanford); H. E. W. (Hythe); 'PONY' (Shrewsbury); 'CLIVE' (Wellington).

C. F. M. L. (Marlborough).—We know of no such manual at so low a price.

J. K. A. (Erlsbank, New South Wales).—(Second letter.) Where possible we will endeavour to meet your wishes.

L. T. (Leighton Buzzard); M.Y. (Madeley); S. U. R. (Handsworth); 'BOL' (Cheshire).

—o—

WELL-KNOWN TEACHERS AT WORK.

XII.—Mr. JOHN H. DEVONSHIRE,

Higher Grade Schools, Mintern Street, London, N.

Long before the introduction of the Board School system the Mintern Street School was in successful operation. For many years it was annually visited by that cultured Inspector of Schools, the late Matthew Arnold, who again and again referred to the work done at Mintern Street, the discipline, the methods employed, and the varied curriculum as all alike excellent. The school was, to quote Mr. Arnold's words, 'Among the one or two schools to which I have been accustomed to send educationists desirous of seeing the best that we accomplished in our elementary schools.'

J. H. Devonshire

Our acquaintance with Mr. Devonshire dates back to the first year of the seventies; but it may be interesting to briefly trace his career antecedent to his opening the school in January, 1857, from which time his zealous and successful labours in the interests of the children and teachers immediately under his care and of education generally are well known and highly appreciated. Perhaps no teacher's name is better known in the country than that of Mr. Devonshire, and the results of his life's labours in this school are far-reaching.

Mr. Devonshire was born in 1835, and began his career as a pupil teacher in 1849 at the Limehouse Wesleyan School. He was thus one of the early band of workers in the cause of popular education. At the close of that course he became an assistant master in the practising schools of the Westminster Training College, and afterwards one of its many distinguished students. He obtained a first-class Queen's Scholarship, and after completing a two years' successful course he was appointed head master of the Mintern Street Schools, New North Road, which position he has held uninterruptedly for thirty-six years to the great advantage of many scholars and pupil teachers, who there received their early training.

On entering the school, which, although not of modern construction, is well adapted for its purpose, the impression that it is under the management of a master-mind is at once felt, and subsequent investigation confirms the opinion. The schoolroom is lofty and well lighted, and the appearance of the children is indicative of intelligent and effective control. Affable and courteous in manner, cheerful and even sanguine in temperament, the master converses freely upon his school methods and experiences. His presence is felt throughout the school, and his earnestness and rectitude of purpose instinctively communicate themselves to teachers and scholars alike. Old boys speak highly of their master, and former pupil teachers acknowledge their indebtedness for thorough grounding in the subjects which go to make up a sound English education.

The school is not a science school, but in addition to the ordinary subjects science has always been systematically and successfully taught. When the Science and Art Department was formed, and classes were established in connection with elementary schools, the Mintern Street School became an affiliated centre. Every year pupils are presented in at least three subjects, generally Light, Acoustics and Heat, or Magnetism and Electricity, Physiography and Mathematics.

French has long been a subject of instruction in the upper classes, and the Government Inspector previously named commended the intelligence and success with which the subject was taught.

Considerable attention is paid to vocal music, and the Tonic Sol-fa method is employed, though the upper boys receive instruction in the old notation as well. It is unusual for the pupils in the upper classes not to obtain the elementary or intermediate certificate.

Questioned as to his methods, Mr. Devonshire said:

'The methods employed in these schools are those founded upon reason and common sense. Novelty is not introduced for the sake of novelty, but any new plan is adopted that commends itself by its success. Lucid and clear explanation, *accompanied* and *followed* by practice and *constant repetition*, are the main features of this school. Some of the good points of what may be called the old school methods are still practised, because I believe that if too much is done for the boys their self-reliance is destroyed. I do not believe much in a superfluity of or too elaborate apparatus. A liberal use of chalk and a good supply of blackboards will make up for any deficiency of this kind.'

Is manual work taught in the school? To this query the answer was given:—'Our premises are not sufficiently spacious to allow of this, but although carpentering is not systematically taught, there are two benches, and those who have a taste for the work are encouraged to make the simple apparatus necessary for illustration.'

A special feature in Mr. Devonshire's work has been the excellent training given to his pupil teachers, many of whom have stood at, or near the top of, the Scholarship list. No superficial work can pass muster, but a wide and liberal course of study both for scholars and teachers must be sedulously followed. In such hands the pupil teacher system attains its highest excellence.

But Mr. Devonshire's labours are not confined to the four walls of the schoolroom, for as a good citizen he interests himself in professional and social duties. He is an able and effective speaker, and at public meetings his services are often called into requisition. Good tempered, courageous, humorous, and generous, his utterances always command respect among friends and before the public.

In the establishment of the National Union of Teachers he took an active part, being its first Treasurer, and for two years, owing to exceptional circumstances, he occupied the Presidential chair with conspicuous success. Of the first six presidents only two remain—Messrs. Graves and Devonshire—and, although they are advancing towards the period, when voluntary or compulsory retirement will become inevitable, their energy and desire to benefit their fellows remain unabated. Referring to Mr. Devonshire's presidency, it may be interesting to recall the fact that in 1875 the first public recognition of the Union at the Conversazione at South Kensington was held. After the event the Executive congratulated the Conference 'on the fact that they possessed a President who could conduct with so much grace and dignity the formal reception of his guests.'

The position of the National Union as an educational influence in the country at the present time is due in a great measure to the discretion and care of the Officers and Executive who first guided its destinies, and Mr. Devonshire, as one of these, while always ready to advance, wished to do this with caution. He always felt that a false step would rejoice the hearts of its enemies and seriously impede its progress.

As a witness before the Royal Commission on Education, Mr. Devonshire gave valuable evidence on the state of education in Voluntary Schools, and stamped himself as an ardent supporter of the Voluntary System. He somewhat surprised the Commissioners by stating that the best Elementary Schools of thirty years ago were quite abreast of those of the present day. From his life-long connection with Voluntary Schools, he naturally believes in their value as a part of our educational system, while at the same time he is a staunch advocate for the maintenance of Board Schools in the highest state of efficiency.

Early in its history the National Union proceeded to make arrangements for rendering aid to the numerous orphan children of teachers who, owing to the premature death of their parents, were left unprovided for. So earnest were Mr. Devonshire's labours in this cause that he is known as 'Father of the Orphanage,' and in season and out of season, at times against great opposition, his disinterested advocacy has resulted in placing the Teachers' Orphanage and Orphan Fund on a firm basis. He was elected Treasurer in 1879, and has ever since held that office.

Two Orphan Homes have been established, and though both of them are conducted in temporary premises, it is hoped that next year, when the Con-

HIGHER GRADE SCHOOLS, MINTERN STREET, LONDON, N. TIME TABLE, 1892.—BOYS.

		MORNING.					AFTERNOON.				
		9-15 to 9-55	10.0	10.20	10-45	11.30	12.15	2.0 to 2.15	2.20	3.15	3-45	4.30	
MONDAY	First Class	Scripture	Mark Registers	Writing	Geography	Euclid	Mechanics	Mental Arithmetic	Mark Registers	Arithmetic	Etymology	Algebra	
TUESDAY		French		Reading	Grammar	Drawing	Light, Sound, & Heat	Mental Arithmetic		Arithmetic	Maps	Shorthand	
WEDNES.		Scripture		Writing	Geography	Euclid	Singing	Mental Arithmetic		Arithmetic	Composition	Algebra	
THURSDAY		French		Reading	Grammar	Drawing	Physiography	Mental Arithmetic		Arithmetic	Maps	Shorthand	
FRIDAY		Scripture		Spelling	Geography	Euclid	Mathematics	Mental Arithmetic		Arithmetic	Composition	Notes & Diagrams	
MONDAY	Second Class	Scripture	Mark Registers	Writing	Geography	Reading	Arithmetic	Mental Arithmetic	Mark Registers	3-0 Grammar	Composition	Algebra	
TUESDAY		French		Spelling	Grammar	Reading	Arithmetic	Mental Arithmetic		Geography	Algebra	Word Formation	
WEDNES.		Scripture		Writing	Geography	Arithmetic	Singing	Mental Arithmetic		Reading	Maps	Algebra	
THURSDAY		French		Spelling	Grammar	Reading	Arithmetic	Mental Arithmetic		Geography	Composition	Word Formation	
FRIDAY		Scripture		Writing	Geography	Reading	Arithmetic	Mental Arithmetic		Grammar	Maps	Notes & Diagrams	
MONDAY	Third Class	Scripture	Mark Registers	Writing	Geography	Reading	Arithmetic	Mental Arithmetic	Mark Registers	3-15 Composition	Reading	Arithmetic	
TUESDAY		Reading		Spelling	Geography	Drawing	Arithmetic	Mental Arithmetic		Maps	Grammar	Reading	
WEDNES.		Scripture		Writing	Geography	Arithmetic	Singing	Mental Arithmetic		Composition	Reading	Arithmetic	
THURSDAY		Reading		Spelling	Geography	Drawing	Arithmetic	Mental Arithmetic		Maps	Grammar	Reading	
FRIDAY		Scripture		Writing	Geography	Reading	Arithmetic	Mental Arithmetic		Revision Geog.	Reading	Arithmetic	
MONDAY	Fourth Class	Scripture	Mark Registers	10.15 Mental Arithmetic	Writing	Reading	Arithmetic	Singing	Mark Registers	3-0 Reading	3-30 Grammar	4.0 Arithmetic	4.30 Geography
TUESDAY		Reading		Mental Arithmetic	Dictation	Drawing	Arithmetic	Singing		Reading	Grammar	Arithmetic	Geography
WEDNES.		Scripture		Mental Arithmetic	Reading	Singing	Arithmetic	Singing		Dictation	Grammar	Arithmetic	Geography
THURSDAY		Reading		Mental Arithmetic	Dictation	Drawing	Arithmetic	Singing		Reading	Grammar	Arithmetic	Geography
FRIDAY		Scripture		Mental Arithmetic	Writing	Reading	Arithmetic	Singing		Reading	Grammar	Arithmetic	Object Lesson
MONDAY	Fifth Class	Scripture	Mark Registers	Mental Arithmetic	Writing	Reading	Arithmetic	Singing	Mark Registers	Reading	3-20 Grammar	Arithmetic	Geography
TUESDAY		Reading		Mental Arithmetic	Dictation	Drawing	Arithmetic	Singing		Reading	Grammar	Arithmetic	Geography
WEDNES.		Scripture		Mental Arithmetic	Reading	Singing	Arithmetic	Singing		Dictation	Grammar	Arithmetic	Geography
THURSDAY		Reading		Mental Arithmetic	Dictation	Drawing	Arithmetic	Singing		Reading	Grammar	Arithmetic	Geography
FRIDAY		Scripture		Mental Arithmetic	Writing	Reading	Arithmetic	Singing		Reading	Grammar	Arithmetic	Object Lesson

ference meets again at Liverpool, after an interval of eighteen years, a subscription, sufficient in amount to purchase two new homes, will be announced. The proposal to provide for orphan children was first mooted by Mr. Devonshire at Liverpool in 1875, and the Mayor, Colonel Thompson, promised his hearty support.

GIRLS' ORPHANAGE: FIRS HILL, SHEFFIELD.

This gentleman died shortly afterwards, but a grand opportunity is now offered to the Liverpool friends, who have ever been to the front in charitable efforts, to crown their labours and rejoice the Treasurer's heart by supplying the means to secure two permanent homes.

To 'live for our children' is a guiding principle with Mr. Devonshire, and he is never happier than when planning and carrying out those plans for their benefit. 'Labour is sweet' in such a cause, and the younger generation of teachers will find their daily labour relieved of some of its monotony by entering as heartily

BOYS' ORPHANAGE: THE POPLARS, PECKHAM RYE.

and thoroughly into their work as the subject of our present sketch, whose ambition is to complete his forty years of service and leave his school at its highest point of efficiency. That his laudable ambition may be fully realised is, we feel sure, the earnest wish of his many friends and admirers.

NOTES AND NOTIONS.

BY RICHARD WADDINGTON,

President of the Half-time Council of Teachers.

THERE is an old proverb which says 'Strike the iron while it is hot,' but the many interested onlookers must have felt that Mr. Yoxall had the still more difficult task of hammering the iron hot in Bassetlaw. In watching the contest and noting the enthusiasm, we forgot the strength of the forces against us. To see the record of meeting after meeting, and to read the admirable and forcible addresses delivered by our champion, was to feel proud that our profession possessed such a valiant leader. Some of us rejoiced that he was in political sympathy with us, while some of us who could not subscribe to his political programme were anxious to see so sound and fearless an educationist at St. Stephen's, although our political faith might be strained to the point where endurance becomes a sin by his record as a politician. The member of the Executive who telegraphed 'Three cheers for Salisbury and Yoxall,' expressed the sentiments of a good many pedagogues.

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BY the ability and energy with which he has conducted the contest Mr. Yoxall has done much to raise the status of the primary school teacher. He has fought bravely, ably, and enthusiastically. Only a few weeks ago he was wielding the chalk and duster in Sharrow Lane Board School. By dint of unflagging zeal and steady pertinacity he has in those few short weeks made himself known and respected in Bassetlaw. So well has he conducted the campaign that he has done as well as any man of the same political colour could have done. Thanks, many thanks, friend Yoxall! We shall see you at St. Stephen's ere long. I must not forget Mrs. Yoxall. When the franchise is extended to the fairer sex she will be a formidable opponent to meet on the 'hustings.' The clever way in which she reserved herself for proposing the vote of thanks to the chairman was really pleasing. Bravo, Mrs. Yoxall!

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BUT where do we stand? We have fought and lost, but we have lost honorably. We have established the fact that a primary school teacher can hold his own as a Parliamentary candidate, and we have proved the reality of the Union's intention to obtain direct representation in the House. There has been a remarkable unanimity in the expression of the teachers, irrespective of political inclination. There are some who still object to direct Parliamentary representation. They have generously waived their objection. There are others who hold that it was a mistake to run only one candidate as it tended to ally us with one party only. I hope that at the next election we shall run two candidates. The Executive did its utmost to secure a second reasonable chance, but failed. We have met with our first repulse, but it is so encouraging that I feel sure victory is nigh.

• • • • •

IT seems certain we shall have a change of Government. Without entering into the political right or wrong of either party, I regret that this means the retirement of Sir W. Hart-Dyke from Whitehall.

Under no previous Minister has the teacher had so free and encouraging *entrée* at the Education Department. Teachers have much to thank Sir William for, but for nothing more than the appointment of Mr. Kekewich, who, being a permanent official, does not 'go out' with the Government. Who is to be the next vice-president? Of course, Mr. Mundella will have something higher. It seems inevitable that the new vice-president will be one of the younger men. I fancy it will fall to Mr. T. Ellis, Mr. A. Dyke-Acland, or Mr. Sydney Buxton. Let us hope that the same broad-minded policy will continue.

* * * * *

'In several schools the floor was of brick or stone, and very uneven. In one school I found a huge gallery—the lowest part of which was three or four feet high—extending down one-third of the room, *with a baker's oven in full operation beneath!* In another school I found a curious relic of ancient discipline, consisting of a cage in the corner of the room with iron bars in front, where the naughty boys were incarcerated.'

Such is the description given by Mr. Cartwright in the Blue Book for 1891 of the Northampton Schools, two years ago. I never felt more inclined to doubt the veracity of a Blue Book than when I read the foregoing description of the modern educational establishments to be found in Northampton. I am pleased to note that such relics of ancient educational apathy are rapidly disappearing.

The days of badly-ventilated, ill-lighted, and insanitary schools are happily numbered. It has always seemed anomalous that the interior of the building wherein education is the aim should be ugly beyond description, and I am pleased to see Archbishop Vaughan protesting against the neglect of the artistic in our schools. In Manchester an admirable society exists, with Mr. Horsfall at their head, for supplying schools with works of art for the decoration of the walls. Suitable pictures are conveyed to and from the schools at regular intervals, without trouble or expense to the school authorities. No more effective means could be taken to remove the reproach often cast at John Bull for his want of artistic culture. What is done for Manchester might be done for every town in England—ay, and every village too.

* * * * *

WHAT can be done for our pupil teachers? Except under large School Boards, where the centre system does something to relieve the teachers, instruction is largely impossible. Teachers are struggling for one hour each day with the impossible task of taking three or four pupil teachers in three or four different periods of history and geography. Surely it is time some effort was made to make it possible for the head teacher to fulfil his duty to the budding pedagogue.

I always feel that the pupil teacher would do better to well and truly digest the history of the last 100 years than skim from 55 B.C. to 1892. This would at least make the subject interesting.

* * * * *

HOWEVER, if so drastic an alteration be premature, there can be no reason why the schedule should not be so arranged that in history and geography the pupil teachers should all take the same portions in any year. The plan has worked successfully for the last ten years in the Diocesan Examination of Pupil Teachers in Manchester. Suppose the work is arranged thus :—

	Geography.	History.
1892 and every fourth year.	The British Islands, Australia and British North America. Physical Geography of mountains and rivers. Maps of the British Isles.	Outlines of British History from Julius Cæsar to the Norman Conquest.
1893 and every fourth year.	Europe and British India. Latitude and longitude. Climate and productions of the British possessions. Maps of France, Italy, and the Spanish Peninsula.	From the Conquest to the accession of the Tudors.
1894 and every fourth year.	Asia and Africa. Winds and ocean currents. Maps of India, South Africa, and the Mediterranean Sea.	From the accession of the Tudors to 1688.
1895 and every fourth year.	America and Polynesia. The seasons, the sun, moon, and planetary system. The tides. Maps of the United States and Australia.	From 1688 to the present time.

In 1892 and each succeeding year all pupil teachers would be taking the same portions of history and geography to the advantage of the next generation of teachers.

Schedule V. demands the serious attention of teachers and legislators. Take the case of a female pupil teacher. She must pass Standard VI. to enter on her four years' apprenticeship, and yet in arithmetic she spends three years in learning what she was reputed to know at her entry, with the result that too often she finishes her apprenticeship with the same mathematical equipment she commenced with. Is it to be wondered at that the arithmetic set at the Scholarship is often a stumbling block?

* * * * *

BEFORE I leave this let me make a suggestion. Lament is general at the paucity of the pupil teacher's knowledge of literature. Is this to be wondered at? Amid the hurry and worry of the every-day life of our pupil teachers there is little hope or chance to tap the varied supply of information so near at hand. To meet this I would fix one evening for 'General Reading.' No fixed lessons should be set, and at morning lessons I would have a chat on 'Books.'

* * * * *

THE Evening School Code just issued is a marked tribute to the broad-minded educational policy inaugurated by Mr. Kekewich. While I hold that it is impossible to meet the demands for continuation of the education of our primary schools so long as the

be-all and end-all is to be examination, yet it is impossible not to acknowledge the wide and suitable schedule given on pages 6, 7, and 8 of the Evening School Code. Teachers may congratulate themselves that in this Code standards are practically abolished. How soon shall they disappear from the older and much more important Annual issued by 'My Lords'?

* * * * *

SHALL we ever eradicate the system of paying sixpence for singing, a shilling for discipline, eighteenpence for drawing, and two shillings for grammar? When will Parliament see that the sure and certain way to make the inefficient still more inefficient is to cut off the wherewithal by which alone efficiency can be produced from inefficiency? Whether the failure lie at the door of the teacher or managers, the Department can, and ought, in the interest of the children and the nation, to remove the obstacle. If the Army or Navy were pronounced inefficient would any sane person suggest a reduction of the vote as a means of producing improvements? Certainly not.

* * * * *

WHY all these ever varying and variable payments? The teacher in the country school is admittedly supplying as full the needs of the locality as the teacher in the Higher Grade Urban School. He, or she, works as long, and often harder; and yet the Government pays less. Why should one school obtain three pounds per scholar from the State, while another, doing equally good work in its sphere, struggles on with three crowns? Education cannot be doled out in penny-worths. Take the case of Mr. Baseden at Brighton. After thirty-one years' service he is sacrificed—sacrificed to raise the grant per head two or three farthings. Her Majesty's Inspector (the Rev. C. F. Johnstone), in a letter to Mr. Baseden, says:—'During the many years that you have been at its (Middle Street Board School) head it has had a great reputation, and it has owed this to your own power as a teacher, and to the great interest that you have taken in the boys.' *Satis Verborum.*

* * * * *

IN a northern town where the School Board prides itself on the complete adaptability of its schools, the chairman was showing a prominent educationist round the schools. The visitor admired the buildings, and congratulated the chairman on the educational spirit of the electorate. As they were leaving the last of the buildings—wherein the speciality was the admirable hat and cloak-room accommodation—the visitor asked where the children's hats were? The chairman now saw that, although the children were in school, the 'hatteries' were practically empty. The master was appealed to and suggested that the two gentlemen should stand outside and watch the children leave. The suggestion was adopted, and as each boy emerged he was seen to fumble under his vest, wherefrom he finally drew his head covering.

* * * * *

FROM *Cassell's Family Magazine* I cull the following interesting note on

'Telling the South.'

'HOLD a watch horizontally in your hand with the hour hand pointing to the centre of the sun. The south will then lie midway between the position of the hour hand at the time and twelve o'clock on the dial, counting backwards. Thus, if the hour hand points to 3 o'clock, the south will be in the direction of the 1.30 p.m. line. Again, if the hour hand is at 10 o'clock, the south will lie at 5 o'clock. The method is most correct a few hours before and after noon.'

* * * * *

A CORRESPONDENT asks me what I think of the following placard, which he tells me was posted in the constituency in which he resides:—

Mr. A.	Mr. B.
Is in favour of the Act raising the age of half-timers to 11.	Voted against the Act, and is not in favour of raising the age.
He is in favour of still further raising it to 12.	

Factory workers vote for Mr. B., the working man's friend!

Such a miserable attempt to obtain the votes of the operatives by sacrificing the little children is contemptible in the extreme.

I need hardly say that Mr. B. is a cotton manufacturer, who finds child labour cheap labour; but I am surprised to find this champion of infantile labour saying that he considers eight hours a day sufficient for a miner. I think if these half-timers had votes, six hours in a factory would be too much for a child of ten.

* * * * *

THE needlework and geography set at the recent Scholarship Examination caused serious commotion among the candidates. How it was expected that the average candidate could

1. Cut out and tack together the paper pattern (half size) of an infant's nightgown,
2. Make up, in calico, the sleeve (full size) of an infant's nightgown,
3. Mark in cross-stitch the initials V. R.

in two hours passes comprehension. It is time the needlework question received a little more attention.

* * * * *

I AM extremely pleased to find in the report for the West Central Division the following:—

'The standard of exemption, if retained, should be raised and assimilated, and half-time absolutely abolished, except under the Factory Acts. What is wanted for our youthful population is not so much the capability of passing a simple examination once for all, as the moral and intellectual results of being for some years under the discipline and instruction of a good school. Under, too, the sample system of the new Code, the examination of individual children for half-time and exemption will become more and more onerous.'

Herein Mr. Barrington Ward digests the arguments in favour of 'Intermittent Inspection' and 'Age and Attendance' admirably. The moral and intellectual effort of the present is too much circumscribed and moulded by the annual visit.

* * * * *

I HAVE to thank a correspondent for the following, the accuracy of which he guarantees:—

Scene: Annual Show Day.

Dramatis Personæ: H.M. Inspector's Assistant and a Boy.

The Inspector's Assistant having told the boy to work the second set of sums from next boy's card went away and forget the incident.

After an interval of ten minutes H.M. Inspector's Assistant returned, and seeing two boys working from

the same card, soundly boxed the boy's ears and accused him of cheating.

When the explanation came, the man of justice coolly said: 'Ah, well, if you don't deserve it now I have no doubt you soon will!'

I give this to show that even Inspectors are human. I am bound to say that personally I have found H.M. Inspectors' Assistants to be fairly good tempered, considering that they get all the drudgery of the examination and a very small share of the 'loaves and fishes.'

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LONDON MATRICULATION.

JANUARY, 1893.

OUR PREPARATION CLASS FOR PRIVATE STUDENTS.

BY T. RUSSELL MALTBY, M.A.
Kingswood School, Bath.

(SECOND MONTH.)

I. LATIN.

Notes on July work.

Allen's Grammar, Sects. 1 to 85.

(1) For more copious notes on Nouns, Pronouns, Adjectives, and Verbs, we are compelled by lack of space to refer our readers to 'THE PRACTICAL TEACHER' for August, 1891, and February, 1892.

(2) Noun-lists, as there advised, should be begun at once. The following are typical entries (from the month's reading in Horace):—

Nom.	Meaning.	Gen.	Abl. Sing.	Gen. Pl.	Other Cases.
Phăsēlus (*os*)	boat	m.f.	*phasel-o*	*-orum*	like *Delos*, 157
Acheron	Acheron	m.	*Acheronte*	no plur.	
Poplĭtes	knee	m.	*poplĭte*	*-um*	
Mĕlos	song	n.	*melo*	not found	N.V.A. Pl. *melē*, also a masc. acc. *melos*.
Aegis	shield	f.	*aegide*	*aegidum*	Acc. S. *aegida*, Acc. Pl. *aegidas*.
Fĭdes	lyre	f.	(*fidis*)	*fidium*	rare in sing.

(3) Write out the full declension of the Interrogative and the Indefinite Pronoun from Sects. 36, 37.

(4) Can our readers *at the first attempt* give the Latin for at least nine of the following ten verbal forms?—1. Ye must be of use; 2. He must be loved; 3. To be about to rule; 4. Thou wilt be taken; 5. Be thou taken; 6. Let us be ruled; 7. He will be heard; 8. Thou wouldst be taken; 9. They must hear; 10. They must be heard.

(5) Similarly for the Anomalous Verbs:—1. They will be able (2); 2. They were unable; 3. We may be willing; 4. Ye would prefer; 5. They must be unwilling; 6. Ye bore (2); 7. We should go; 8. They will be made; 9. They would be made; 10. He would eat.

Horace, Odes III. 1 to 6 (T. E. Page) *Supplementary Notes.*

1. 2. *Favete linguis: keep holy silence.* 4. *Virginibus puerisque:* only the young and simple have ears to hear the poet's high doctrine. 5. *Timendorum:* an adj. here, *dread.* 7. *Glorious for the triumph won over the Titans, and . . .* 8. *Ordinet:* consecutive subj. after *ut*, as also *descendat, contendat, sit. Moliar* and *permutem* at the end are dubitative. 12. Notice the ablatives that have occurred already: *linguis* (instrument or respect), *triumpho* (cause), *supercilio* (instr.), *viro* (comparison), *sulcis* (place where), *moribus* and *fama* (respect). 17. *Cui:* dat. of person concerned, to be translated as gen.; *above whose guilty neck.* 19. *Elaborabant* = *operose parabunt* (Orelli); *will not yield for all the labour spent upon them.* Supply *illi*, which will be the antecedent of *cui.* 20. *Avium, i.e.*, singing-birds, kept in aviaries by wealthy Romans. 25. Here is the central thought of the Ode. *He who only requires what is enough is disquieted neither by. . .* 30. *Fundus mendax: a farm that breaks its promise, cf.* 16, 30, *segetis certa fides, the sure word of a crop.* 31. *Nunc . . nunc . . nunc:* the fruit-trees always have an excuse ready. 34. *i.e., redemptor cum frequentibus famulis, the builder with his busy gang*, or, *frequens* may mean *numerous.* 37. *Quo* (*scandit*) *dominus: clamber to the same place as the lord.* 45. Ablatives: *invidendis postibus* (quality), *novo ritu* (manner), *valle* (price). Look up the construction of *permuto.*

O why for riches, wearier far,
Exchange my Sabine vale? (Lord Lytton.)

2. 1. *Hardened in the sharp school of war, let a boy learn well to endure privation gladly, and as a horseman dreaded for his spear, let him...* 2. *Robustus* must be taken predicatively as above; *acri militia* may also be taken as abl. of means with *condiscat.* 8. If *virgo* is the queen's daughter (Page), then *sponsus* is not the *tyrannus* but some other (young) prince. 9. *Suspiret:* jussive, like the preceding subjunctives. 11. *Leonem, i.e., illum*, the youth; *yon lion.* 16. *Poplitibus*: fugam significat (Orelli); *timido: recreant.* 17. This is the true Stoic teaching: the wise man is in reality always successful, always a governor and king. Horace here chooses his terms (*repulsae, &c.*) from the language of elections. 19. *Secures:* for *fasces*, see Dict. 23. *Udam humum: mire.* 25. *There is for faithful silence, too, a safe reward.* 26. *Cereris sacrum:* mentioned simply as an instance of a secret which should be kept. 28. *Sit* (and *solvat*) A. and H., Sects. 243, 107. 30. *When slighted, hath confounded the good man with the wicked.* Account for the ablatives *militia, hasta, tactu, arbitrio, via, penna, pede claudo;* the datives *poplitibus, tergo, immeritis, silentio, incesto.*

3. 1. *The upright ... man ... is not shaken by the passion.* 2. *Prava:* obj. of *iubentium; commanding wrongful acts.* 8. *Impavidum:* supply *eum*, obj. of *ferient.* 11. *Inter* follows its case; in 37 it is even separated from it. 13. *Hac* (*arte*); so in 15. *Merentem* is emphatic; *'twas this that made thee worthy of the prize, when thy tigers drew thee.* 17. *To the gods in council*, deliberating whether Romulus should be admitted. 18. *Ilion:* obj. of *vertit.* 23. *Damnatum* agrees with *Ilion; given-over-for-punishment to me and chaste Minerva together with....* 24. *Duce fraudulento:* Laomedon. 28. *Hectoreis opibus: by Hector's aid.* Look up all the allusions. 30. *I will resign to Mars my great wrath and my hatred of my grandson.* A. and H., Sect. 81. 36. *Ordinibus:* ind. obj. of *adscribi.* 39. *Beati:* predicatively, *reign in blessedness.* 41. *Insultet: trample over.* 42. *Inultae: with impunity.* 43. *Stet:* jussive subj.; *fulgens:* predicatively; *let the capital stand in glory.* 45. *Late:* with *horrenda; feared far and wide let Rome extend her name.* 50. *Spernere: i.e., in spernendo.* At the end of Page's note read *rapiente* for *cogere.* 56. *Qua* (*parte debacchentur*). 61. *If under evil omens it revive again.* 66. *Thrice should it fall rased by my Argives, and thrice should the wife mourn in captivity for* (*lost*) *husband and sons.* 70. *Cease, presumptuous one, to recount the converse of gods.* 72. Study *modus* in Dict.

4. 1. *Caelo:* in prose *ex* would be required; *age:* interjectional, *come, utter; tibia:* abl. of instr. like *voce, fidibus, cithara.* 2. *Regina:* in apposition with *Calliope.* 8. *Quos:* obj. of *subeunt; et . . et: both . . and.* 10. *Altricis: altrix* (*altor—alo*), a nursing-mother; here used of his native Apulia. Another reading is *nutricis.* 11. *-que* joins *ludo* and *somno.* 12. *Puerum* in app. with *me; me, when a child.* 13. *Foret:* consecutive subj. 17. *Tuto corpore:* Allen, Sect. 122, but this usage is better described as abl. of attendant circumstance. 18. *Dormirem, premerer:* subj. of ind. quest.;

so in 44. 29. *When soever ye are with me, gladly will I, a mariner, assay the raving Bosphorus and, on foot, the burning sands of the Assyrian shore.* 33. *Cruel to strangers.* 34. *Who revels in horses' blood.* 41. *Datis:* pres. ind.; *dato* (consilio). 42. *We know how the monstrous troop of unholy Titans were quelled with swooping thunderbolt by him who* . . . Study *ut* in Dict. 49. *Iovi, Olympo:* Allen, Sect. 118; *minaci statu,* 121 (j.). 55. *Evolsis truncis:* abl. of cause, explaining *audax;* translate *bold hurler of uptorn trees.* 57. Caeca vis contra sapientiam (Or.). Pallas was the goddess of wisdom. 58. *Hinc . . hinc:* simply *here . . here; avidus: eager for the fray.* 59. The order is, et (is) qui, nunquam positurus arcum umeris, lavit crines solutos rore puro Castaliæ. Apollo will never be found unprepared. 67. *In maius:* literally *to (something) greater; idem: they also;* see Dict. 69. *Hundred-handed Gyas (is) witness.* 74. *Maeret* governs *partūs missos;* the Giants and Titans were children of Earth. 75. *Perēdit.*

5. 2. *Will be accounted a god in our midst,* but *praesens* also suggests its more usual meaning, *present to bless.* 8. *Consenuit:* how long was it since Carrhae? 10. *Nominis: i.e. Romani.* 13. *It was this that . .* 14. See Dict. for syntax of *dissentio.* 15. *Exemplo:* abl. of instr. 16. *Veniens:* agr. with *aevum.* 17. *Immiserabilis:* predicatively; so *acrior* in 25. 18. *Signa* recalls the standards lost at Carrhae. 20. *Militibus:* dat. with *derepta.* Allen, Sect. 118. 22. *Bound behind a free-born back, i.e.,* the backs of freemen. 24. *Vidi brachia retorta—portas non clausas—arva coli:* in English we can continue with a pres. part. pass. 26. *To disgrace you are adding loss.* 30. *Deterioribus:* dat. or abl. masc. 34. *And he shall crush the Carthaginians in a second war who, the coward.* 41. *Fertur:* of course not impersonal. 46. *Firmaret, properaret:* after *donec,* the subj. denoting purpose; *so long as he was trying to strengthen . . and to hasten away.* 52. *Reditus:* acc. pl. obj. of *morantem.* 53. *Non aliter quam si: not otherwise than if, just as if.*

6. 1. *Though innocent thou shalt atone for the deeds of thy forefathers.* 2. *Refeceris:* indic. 3. *Aedes: temples,* (usually *a house*). 4. *Smoke-grimed statues.* 6. *To this ascribe every ending.* 11. *And smile again to have added the booty to their poor collars.* 13. *Paene:* with *delevit; occupatam;* here, *occupied with.* 18. *Genus:* sanguinen, stirpem (Or.) 26. *Amid her husband's banquet.* 27. *Cui:* with consec. subj., '*one to whom she may.*' 32. *Pretiosus emptor:* magno pretio emens (Or.) 33. *His parentibus:* Allen, Sect. 121 (*b*). 37. *Mascula proles docta versare . . . portare.* 43. *Bobus:* Allen, Sect. 121 (*a*). 44. *Agens:* agr. with *sol,* governing *amicum tempus; . . and brought in, as his own chariot departed, the welcome time of rest.* 46. *Has borne ourselves more worthless still, destined to beget offspring even more corrupt.*

Latin Course for August.

1. *Allen's Grammar, Sects. 149 to 153.* ('Principal Parts.') Learn the meanings. Observe the footnotes. For complete mastery, cover up each of the five columns in succession, and supply the others. Be careful about the *quantities* of the vowels.

2. *Allcroft and Haydon, Sects. 56 to 134.* Learn the examples.

3. *Allcroft and Haydon,* Exercises III., IV., V. A's and B's only. (Sixty Sentences.) One exercise after each chapter of the syntax. Learn the vocabulary before beginning an exercise.

4. *Horace, Odes III. Carmina VII.-XX.* Make a written translation.

II. GREEK.

Notes on July Work.

Heracleidae, 1 to 231 (C. S. Jerram). *Supplementary Notes.* 1. πάλαι ποτέ: *for some long time hath this been my belief,* but ποτέ need not be translated. 3. *Whilst another having a mind eager after gain is useless to a state and ill to deal with.* 6. αἰδοῖ: causal dat., *for conscience sake;* so οἰκτῳ (129), φόβῳ (191); σέβων: causal partic., *because I respected;* so δεκεμένοι (147), ἀφαιρεθείς, ἀμύνων (164), etc. 7. ἐξὸν: partic. of ἔξεστι (concessive), *though it was possible for me;* so γεγώς (30), πράσσων ὤν (120), ἀφιγμένων (144). 8. *Shared with Heracles more labours than any other man.* 12. *For after their father had been removed from earth.* 14. See lexicon for strict meaning of εἶχομαι. 16. ἄλλην πολιν: acc. without prep. to denote *place whither,* as frequently in poetry, *e.g.,* lines 37, 82, 85. 19. *Sending heralds to every part of the world where he learns that we are settling, he demands our persons and tries to drive us out of that land.* 22. Θέσθαι: epexegetic inf. after σμικράν, *no mean state to have* (see lexicon) *whether as friend or foe, and himself also as a prosperous king.* 23. *And the people seeing that my power to aid is small, and that these children . . . .* τἀμ' ἐμοῦ: crasis for τὰ ἀπὸ μου. 26. Φεύγουσι, πράσσουσι: partic. agr. with τέκνοις; distinguish κακῶς ποιέω and κακῶς πράσσω. 30. Decline γεγώς. 33. *And are sitting by the altar, supplicating the gods to help us;* of course ἱκέται is a noun, and θεῶν objective gen. 34. *For there is a story that;* supply ἐστί with λόγος. 37. ἔκατι follows its case, so ὅτῳ (50), οὕνεκα (166). 39. *And by two aged people this flight is conducted.* 41. *And, secondly, Alcmene holding the daughters of her son clasped in her arms, inside the temple here.* 45. *And his brothers who are eldest born,* literally, *to whom age is eldest;* see Jerram's note on 479. 46. γῆς: partitive gen. after adverb of place as in 19. 47. πρὸς βίαν: *forcibly.* (Make a list of these prepositional phrases.) 49. *Coming hither* (τόνδε) *towards us the herald of.* 51. *Poor wanderers banished from every land.* 52. *Would ye might perish, thou and the man that sent thee;* χὠ crasis for καὶ ὁ, so ἀγών (ὁ ἀγών) 116, κἄσφηλεν (καὶ ἔσφηλεν) 128, χοὐν (καὶ ὁ ἐν) 173. 53. *How many messages of woe didst thou utter also to the noble father of these boys from that same mouth of thine.* 55. ἦ που: *No doubt.* (Make a list of these particles and their meanings.) 56. Take σύμμαχον like καλήν: *and that the city you have come to is friendly.* 57. *There is no one who will choose thy useless strength in preference to the power of Eurystheus.* 59. χώρει: imperat.; τί: *why;* ταῦτα: acc. of respect, *thus.* 60. εἰς: pregnant use of a prep. 61. οὐ δῆτα: *nay, surely.* 70. ἀμῦνετε: imperat. 74. *What distress will it soon reveal.* 76. ὦ τάλας: of himself. 77. τοῦ: gen. οἱ τίς; *art thou cast down thus piteously upon the ground.* 84. *No islander's life do I lead;* νησιώτην is adj. 87. ἴσον: *I suppose.* 89. σῶμα τόδε: *i.e.,* I; supply ἐστι. 94. *Hither come to supplicate thee and thy city.* 95. *Or (are they come) anxious to obtain.* Make a list of these poetic forms, *e.g.,* δαρόν, σᾷ, λαόν, πόλεος, δοκῆσαν, πλάτᾳ; what would they be in Attic prose? 97. θεῶ is a misprint for θεῶν; supply μελόμενοι; *that they may not be given up nor . . go to Argos.* 101. εἰκὸς: supply ἐστί; ἱκτῆρας is obj. of dep. αἰδεῖσθαι, σφε is subj. of ἀπολιπεῖν. 105. Distinguish νυν and νῦν. 106. οὐδέν: adv. acc. 109. *Yet at any rate it is well that a man should keep his foot out of trouble, adopting the discreet course, which is better.* 111. Look up οὔκουν and οὐκοῦν; the former remains equivalent to οὐκ οὖν, the latter has come to be equivalent to a simple οὖν; χρῆν for ἔχρην, past tense (see lexicon); *ought you not then to have, etc.* 113. Treat σέβοντα like φράσαντα, *and to have respected.* 116. Distinguish οὗτος and ὅδε., ἆρα and ἄρα; *surely then this dispute would be best before him.* 119. *To hear this claim.* 120. ἔφθης: Synt. § 108. 123. *These are the sons of H., and they sit as suppliants.* 126. Literally: *Why, pray, did this occurrence require cries of woe.* 128. ἔστησε: *caused.* 130. 'Rhythm of dress': look up the meanings of ῥυθμός. 132. Literally: *thine it is to tell me, and not to delay, leaving the borders of what land art thou come hither.* 134 This speech of Copreus requires very careful study. 137. ἄξοντα: Synt. § 97; πολλά: obj. of ἔχων. 140. ἐκ τῆς ἐμαυτοῦ (χώρας): with δραπέτας. 142. There is emphasis on πόλιν. 143. Take κυρίους (adj. fem.) after δίκας. 144. *And though they have reached the hearths of many others.* 150. *For they cannot hope that thou alone in all Hellas. . . if thou art a man of sense, wilt.* 153. φέρε: interjectional, *come; τε . . τε* introduce the two cases which are to be compared. 155. τὰ μέν: *on the one hand.* 159. Look up the meanings of καθίστημι. 161. μὴ δόξῃς and μὴ πάθῃς below: Synt. § 178. 162. φήσεις is followed by inf. ἔχειν; the subj. of ἔχειν is σύ understood (Synt. § 157 (*a*)): in agreement with σύ are ἀφαιρεθείς, θείς, ἀμύνων, but θείς must be taken closely with ἔχειν; the other two are causal participles, and may be treated thus: *Of what territory wilt thou urge that thou hast been deprived, or what allies wilt thou say thou art succouring, that thou maintainest war.* 166. The order is: οὕνεκα τύμβου-γέροντος ὅστος τὸ μηδέν; τὸ μηδέν is an indeclinable phrase; *for the sake of an old man on the verge of the grave, a mere nothing.* 167. ὡς εἰπεῖν ἔπος: Synt. § 90. 170. πολλῷ qualifies ἐνδεές, which of course governs gen. 173. ψυχήν: Synt. § 12. 177. πάθῃς cannot be exactly rendered: *behave not thou, as ye Athenians are wont to do, and choose.* Read again Introd., p. 8. 182 is explanatory of τόδε. 184. τῷδε: Copreus. 185. Note the construction of μέτεστι. 186. Note the accusative after φεύγομεν: *We are exiles from our country;* so ὅρον (189), τὸ Ἄργος (190). 187. *How could he justly carry us away as Mycenaeans, when we are in this case,—us whom . . .* 191 would tell with the poet's audience; see Introd., pp. 4, 5; so 199, 200, etc. 194. *Not justly, it is true, but still praising up thy Argos in just such language as.* 198. *Is no longer free.* 200. *They will be willing to die rather.* 202. *For indeed 'tis invidious to praise over much, and many a time I know I have myself been vexed when praised too much.* 205. σοι with ἀνάγκη (ἐστί); ὡς: *that,* after φράσαι. 211. *And she was the daughter of Pelops's daughter.* 212. *Our father and theirs would be sprung from first cousins;* verb

singular instead of plural. 214. *That thou oughtest to pay the obligations which are outside of the relationship.* 216. The subj. of γενέσθαι would be nom., hence σύμπλους and ὑπασπίζων. 219. μέτα follows its case, hence the accent; so ὅτο in 50. 220. Note the cases governed by ἀντιδοῦναι. 223. *And a disgrace in thy city as well.* 224. κακῶν: Synt. § 16 (*c*). 227. Take πρός with γενείου only: *do not, by thy chin I entreat thee, do not. . .* Parse ἀνειμένον, δεδορκότες, ἥμενε, ἀπεστερημένοι, ὅλοιο, ἧσθα, ἴστε, πείσεται, μεθεῦναι, ἔφθης, ἐσφηλεν, ἀφίξαι, ἀντίθες, παρεὶς, μεθήσομεν, ἀμβήσει, δούς, ἐὼν, κτῆσαι, ἀπώσει, ἐξελῶσι, τῖσαι.

Greek Course for August.

1. *Abbott and Mansfield, Sects. 87-111.* (Numerals, Pronouns, Regular Verb.)

2. *Abbott and Mansfield, Syntax, Sects. 1-32.*

3. *Heracleidae, 232-460.* Write out your translation, compile a vocabulary, and work, as it were, *grammar in hand.*

4. *Translation at Sight.* (Colson, Part I., xlviii.-lx.) Beginners should make quite sure of the first twelve 'introductory remarks.' Candidates who hope to take the Intermediate Examination will find valuable help in this book; they should master all the introductory remarks, read most of the stories and legends, and translate a few exercises. In translating at sight, first read through the piece carefully, noting any words to which you can assign no meaning; after looking these up in the vocabulary, try the piece again, and finally, unless it is very easy, write out a translation.

III. ENGLISH.

Notes on July Work.

Mason's Historical Outline and *Hewitt and Beach.*

(1) Base your work on *Mason.*

(2) Classify the Aryan languages in clear tabular form. Draw up a table like H. and B.'s, and supplement from *Mason* and the following notes.

(3) Call the first stock *Indian*, and add

4. *Pali*, the sacred language of the Buddhists.

5. The original *Gipsy* speech.

Cingalese is the language of Ceylon.

(4) *The Iranian stock. Zend* is the usual name for the language of the Avesta, the sacred books of the Zoroastrians. *Pehlevi* is a later form of the Persian language than Zend, chiefly preserved in translations of the Zend-Avesta. *Parsi* is a later form of Persian than Pehlevi. Modern Persian, it seems, is not wholly Aryan. *Pashtu* (usually written *Pushtu*) is the language of Affghanistan.

(5) *The Keltic stock. Cornish* is extinct. The *Breton* (Armorican) was introduced from Britain. Spell Gadhelic *Goidelic.*

(6) *The Romanic stock.* Add the old Italian dialects, such as *Oscan* and *Umbrian.* In the Romance group place *Provençal. Roumansch* is spoken in the Grisons of Switzerland.

(7) The Teutonic stock should be classified thus:—

(A) EAST-GERMANIC.

(*a*) *Gothic*
(*b*) *Scandinavian* or *Scandian* — Norwegian, Icelandic, Danish, Swedish.

(B) WEST-GERMANIC.

(*a*) *High German* — Old Saxon, Dutch,
(*b*) *Low German* ... — Flemish, English, Frisian.

(8) Call the seventh stock *Baltic. Prussian* became extinct in the sixteenth century. *Lettish* is also called *Livonian.* Add 3. *Lithuanian*, still spoken in East Prussia.

(9) *The Slavonic Group.* Add *Old Bulgarian* or *Church-Slavonic*, and the *Illyrian* dialects (*Servian, Croatian, Slovenian.*) The Bohemian is called *Cechish.*

(10) *Words of Keltic Origin.* Note the chief reason (H. and B.) why so few of these were adopted from the Britons, viz., *that the Britons were to a great extent Romanised.*

(11) *Words of Latin Origin.* The Anglo-Saxons, even before their settlement in England, had borrowed a few Latin words, *e.g., camp, mile, wine,* and perhaps *street.* These, strictly speaking, form the earliest class of Latin words. To the Latin words adopted from the Britons add *wick, a town* (Lat. *vicus*), and *pool*, Welsh *pwll* (Low Lat., *padulis*).

(12) Notice how many of the Latin words introduced A.D. 600-800 are of Greek origin—about 50 out of 140.

(13) Both Skeat and Sweet divide the historical development of the language more broadly than Koch. The division, of course, is purely arbitrary:—

1. *Old English*, the period of *full* endings, 450-1200.
2. *Middle English*, the period of *levelled* endings, 1200-1500.
3. *Modern English*, the period of *lost* endings, 1500.

(14) The History of the *Dialects* is important.

English Course for August.

1. *Mason, pp. 9-62.* Alphabet, Accent, Noun, Adjective, Pronoun. Make sure of *Mason* first.

2. *Hewitt and Beach, pp. 563-594, 6-110.* No doubt this is a heavy task. Work on the Alphabet is very important. The chief definitions should be marked to facilitate rapid revision. H. and B.'s questions will be timely tests of your work on *Mason.*

3. *Analysis.* Occasional practice, and on a uniform method.

4. *Ransome's History, to 1399, with the Geography relating thereto.* Give definiteness to your reading by means of Curtis or compact notes of your own.

IV. MATHEMATICS.

1. *Arithmetic.* Occasional work at Matriculation questions.

2. *Hall and Knight's Algebra, Chapters IX.-XIV.* Work only the harder examples in IX.*a* and IX.*b*. In Chapter X. the chief thing to be noticed in the solution of problems is *the preliminary statement.* In Chapter XIII. note the method illustrated on p. 85, by which the reciprocals $\frac{1}{x}$, $\frac{1}{y}$ are treated as the unknown quantities.

3. *Hall and Stevens's Euclid.* The propositions of Book II., with a few of the exercises.

V. MECHANICS.

Our Text-Book will be *Wormell's Elementary Mechanics* (Edward Arnold, 1892, 4s.). We have little doubt that this is now the best book for Matriculation candidates. It is written for the purpose, and contains 80 pages on Hydrostatics. At the same time our readers would gain help in this difficult subject from *Magnus*, the friend of so many generations of London candidates.

Course for August.

Wormell's Introduction, and Chapters I.-V. Learn the definitions and mark them for rapid revision. Commit the formulæ to memory, and be ready with their proofs. The Laws of Motion must be learned by heart. Practise rapidly sketching the principal apparatus, and use diagrams freely in working out exercises. Dibb's *Worked Examples in Mechanics and Hydrostatics* (Clive and Co., 1s. 6d.) will afford good training, but the symbols of the formulæ are those used by Magnus.

VI. CHEMISTRY.

Kemshead, Chapters III., IV., V. (Theory), *X.* (Oxygen), *XI.* (Water). In X., Ozone need not be studied, nor Hydroxyl in XI. Briggs's *Synopsis of Non-Metallic Chemistry* (Interleaved, Clive and Co., 1s. 6d.) is a useful book.

VI. HEAT AND LIGHT.

Stewart, Chapters V., VI., VII. Expansion of Gases, Calorimetry, Liquefaction, and Solidification. Those who find the calculations too difficult may be glad to have the same author's *Heat and Light Problems* (Clive and Co., 1s. 6d.). Our readers should endeavour to see some practical experiments, whatever be the branch of science in which they are studying.

EDUCATION IN LITERATURE.

BY THOS. CARTWRIGHT, B.A., B.SC. (LOND.)

THE year of grace 1892, besides being the fourth centenary of the discovery of America, is the tercentenary of two of the greatest pioneers of Education, viz—Comenius and Montaigne, the former having been born and the latter having died in 1592. Mr. Arthur Tilley, in *Macmillan's*, is giving his readers an interesting account of the latter of these two giants among educationists, and, in this month's issue, we have a pithy account of Montaigne's pedagogics. 'I cannot help thinking,' says Mr. Tilley, 'that he would have been pleasantly surprised to see himself ticketed, not only as an educationist, but as a separate species of that august genus—a naturalist is, I believe, what they call him—for, in good truth, his educational views are anything but systematical. They are to be found partly in his essay "On Pedantry," partly in that "On the Affections of Fathers to Children," but chiefly in the essay entitled "On the Education of Children," and addressed to Diane de Foix, Comtesse de Guison.' The child, for whose benefit the essay was intended, was still unborn; but, quaintly says Montaigne to the fair comtesse: 'You are too noble to begin otherwise than with a male.' And so the education of this somewhat supposititious youth is mapped out, and educational greatness at the same time is thrust upon Montaigne. In connection with the present struggle between the Classics and the Moderns it is interesting to note that the great essayist anticipated the position taken up by the latter, for, says he: 'Greek and Latin are beautiful ornaments, but we pay too dearly for them.' This is all the more emphatic, because Montaigne was a profound classical scholar. 'The aim of all our fathers' care and expenditure is but to furnish our heads with learning; of judgment and virtue you hear nothing.' Cry out to a crowd, of one passer-by, 'What a learned man!' and of another, 'What a good man!' and all eyes and reverence are turned towards the former. We readily ask 'Does he know Greek and Latin? Does he write in verse or prose? But the question whether a man has become better, or more sensible, which ought to have been the first, is left to the last.'

To form a boy's character and to prepare him for life, and to fill him, not so much with learning, as with the desire of learning was Montaigne's educational ideal. 'An honest curiosity for information about everything' was to be the outcome of schooling on our 'naturalists'' lines, and it is certain that these old-world contentions are equally applicable in these latter days when in Mr. Tilley's words, a large number of persons, concerned with education, if they have equipped a boy with a sufficient stock of learning to enable him to pass an examination, fold their arms and think they have done all that is needful.

Much more might be added in proof of the fact that this versatile essayist and erudite philosopher is deserving of more than 'honourable mention' as an educational reformer; but we must now turn to the burning question of Superannuation, which is given the post of honour in the *Educational Times*, and is sympathetically referred to in the *Journal of Education* In the former journal the case for pensions is put somewhat as follows:—If teachers are only as other men, with regard to sickness and old age it would be politic to assist them in making provision for the winter of their lives, so that they may not, in the words of Burns, say—

> O life! thou art a galling load,
> Along a rough, a weary road,
> To wretches such as I!

Again, if the status of civil servant be granted to the elementary teacher, it must be conceded that pensions are an undeniable right; but, in sooth, the teacher's work grows more and more harassing as senility approaches, and whereas the ordinary worker can manage to get through with his tale of bricks, if a little extra time be granted, the teacher finds his task hopelessly impossible when his 'way of life is fallen into the sear, the yellow leaf,' as Macbeth puts it, 'the irksomeness of teaching under such circumstances becomes unbearable, and the breakdown of teachers, therefore, after a certain age, which varies according to the constitution of the individual, becomes certain and rapid. Hence the absolute necessity for superannuation, in the interest of Senex, his pupils, and of the aspirants to promotion, who are more than surfeited with that 'hope deferred, which maketh the heart sick.'

A mouth-watering reference to the pensions, offered by endowed schools to their masters, follows, and details of the now well-known proposals respecting 'existing' and 'future teachers' are given by way of comparison.

The extreme niggardliness of these recommendations is admitted; but, at the same time, it is suggested that no opposition should be allowed to endanger the life of this frail and feeble offspring of the dawning sense of justice of a grateful and appreciative country; but that the expectant *bénéficiaires* should show a modicum of that gratitude which consists in a lively expectation of favours to come.

Professor Gladstone's Journal launches its thunderbolt in good set terms. 'The expectations aroused were doomed to disappointment. The children clamoured for bread and, it is true, the committee did not recommend that they be offered a stone. The committee recommend that they be given very passable bread—but such a little bit! The outlines of the scheme are reasonable, but the sums offered are miserably small. A master, for example, entering the service at twenty-three, and contributing, out of a salary never exceeding £80, £3 a year until he was sixty, would then be entitled to a pension of £44. A mistress, contributing £2 a year out of a salary of £55, would be entitled at fifty-five to a pension of £27. Perhaps thirty years of living on £55 would have taught the poor creature how to starve on £27.

In the *Educational Review*, the National Union of Teachers has a five-paged notice from Mr. Lyulph Stanley, the doughty champion of the Progressive minority of the London School Board. Taken as a whole, the article is distinctly sympathetic in tone, and it furnishes food for thought for those 29,000 teachers who feel it to be their duty to hold aloof from the Teachers' Organisation. In Mr. Stanley's opinion, 'there is no doubt that Parliamentary action is largely determined and directed by the energetic agitation which is organised at these conferences, and which teachers enforce by deputations, by personal communications, and in the press in the various constituencies.'

The action of the Union with respect to the areas of School Boards, the management of Voluntary Schools by a committee of not less than seven persons, aboli-

tion of compulsory extraneous duties, superannuation, intermittent inspection and claim for admission into the inspectorate, is noted; and the writer of the article himself sums up the position in the following words: 'There is no doubt that a more assured position, better pay, security of tenure, on the condition of efficiency (*i.e.*, *ad vitam aut culpam*), and a sympathetic, but thorough inspection by men promoted from among the ablest and most experienced teachers, while objects of desire to the teacher, are also necessary conditions of an improved educational system; and the Teachers' Union, in striving for these things, is entitled to the support of those who wish to make our national education worthy of the country.

In return, the teachers are to be expected to insist upon a wider and more efficient system of professional training and culture, the reply to which may well be supplied from Addison's Cato:—

> 'Tis not in mortals to command success,
> But we'll do more, Sempronius: we'll deserve it.

Indeed, Mr. Stanley himself observes that Day Training Colleges in connection with University Colleges, the facilities for University Education afforded by Chelsea, Battersea and Borough Road Colleges, wherein an attempt is to be made to enable the student, who remains three years, to graduate at London University, are indications of the fact that there are Progressives outside the pale of the London School Board and County Council, and that a great forward movement, in the education of the schoolmaster, is imminent. May his prognostication prove eminently true! In continuation, we are told that 'If national education is to progress, the position of the teacher must be made attractive and, to secure this object, several steps must be taken.' We must draw a better class into the profession by a reasonable scale of salaries, much in advance of the present average; we must give the teacher a more independent position, which will secure him more social recognition, and we must secure, by intelligent inspection, that the best teachers will be encouraged in their work whilst the crammer and the unscrupulous (trickster) will be found out and relegated to 'fresh fields and pastures new.'

Although there are many conclusions in this article with which we are bound to disagree—*e.g.*, as regards the writer's opinion that the Union is receding from its position of political neutrality, and also his belief that the good of the teacher is considered rather than the interests of education—still we welcome Mr. Stanley's remarks as presaging an increase of influence for our Union, and we will conclude our notice of the article by quoting its last paragraph: 'It is growing year by year more manifest that it is only through national co-operation and public management that we can look for progress which must benefit and elevate the teacher, as well as improve the schools. We are, therefore, confident that the great Union of Teachers will inevitably be carried forward in the same direction, and we hail with satisfaction the growth of that society, and see in its yearly recurring conferences evidence of a broader and more educational spirit which will entitle the teachers to an influential voice in shaping the course of National Education.'

'Scratch a German and you'll find a soldier' aptly expresses the burden of the opening paragraphs of an interesting sketch of the 'German Schoolboy' in the *Educational Times* by 'Curt Abel,' according to whom the very life and soul of education is stamped out of it by the rampant militarianism which exacts unthinking obedience from all. As a result, 'kept in check by a severe military discipline,' the boys learn from the very first day of their school life to submit to the will of others. With little consideration of boyish likes and dislikes they are treated like recruits—the drilling of mind and character being made the object of German pedagogism. It strikes the English observer that German schools ignore the bodily welfare of their pupils. There are no games, no play, no exercise whatever, except a couple of hours devoted to military gymnastics during a week of hard mental work. . . . The average girl becomes wife and mother of obedient recruits, and the average boy learns by-and-by to despise everything like liberty and independence. The German youth, having at the age of nineteen years passed a hard entrance examination to the University, knows all the details about the glorious qualities of all the kings that ever existed, but he knows less of life than an English boy of eleven or twelve.'

Of the 'Gymnasium,' which, together with the 'Realschule' provides education for the upper classes, the writer says that they are steeped to the lips in antiquity. Greek and Latin receive most attention. English is not attempted, and German itself is sadly neglected; French, moreover, is only learnt because of its prospective utility in connection with that ever-expected 'Revanche.' I think I am entitled to say that the gymnasiast lives rather in antiquity. He knows the birthday of the great grandmother of Hannibal; he knows the colour of the petticoat in which Cleopatra committed suicide; he knows, above all, how the old Germans brewed their beer, and how they consumed it in their 'Trinkgelage.'

In the opinion of this gentleman the Germans have a morbid dread of the word 'revolution,' which is only mentioned in order to form an excuse for the expression of utter disgust and monarchial horror. 'The spirit of modern times is scrupulously excluded from German schools, because the doctrine that kings are born to be servants of the people seems to find no place in the heart of a model German subject.'

Then follows a word or two as to the German schoolmaster, amongst whom are some 'wonderful specimens' many of whom are born a trifle of a thousand years too late.

The 'Realschule' rejects Greek and gives prominence to modern language and natural science, and thus makes its pupils more fitted for a practical life than does the Gymnasium; but, *mirabile dictu!* this is a disqualification for many careers, the Realschuler being excluded, by law, from the professions of law and medicine. Here is a picture of the German schoolboy's life. 'When six years old he enters a school. What a festive day when the little fellow first leaves his parents' house, his knapsack heavy with books and cake! But soon the lad finds that learning in Germany is rather a serious thing. His frolicsome joy will cease, boyish play gives way to work—work that soon accumulates to an unreasonable extent. The English boy devotes himself to play between school hours. An English school without playgrounds, without football or cricket, is unheard of. There the boys have the benefit of manly exercise and forget Cicero, Homer, and Co.

'What a different sight in the dear pedantic Fatherland! National games do not exist—with but one sad exception: in the Universities *duelling* is considered

a game. As all bodily exercise tends to increase the feeling of self-reliance, and, as self-reliance is a germ of liberty, such exercise is limited in German schools to the utmost degree. It was my lot to be educated in different German 'Royal' schools, so I speak from personal experience. We were punished if we dared to run about in the schulhof during the short five minutes interval between each lesson. Throwing snowballs in winter was considered something of a crime.' Every punishment was scrupulously entered and reported at home, sometimes by means of an unpaid letter.

Then Curt Abel bursts into rhapsody. 'O, happy boys, enjoying the liberty and fostering care of England! You do not know how much you owe your country from the first day of your life.'

To complete the lugubrious picture we are told that one of the masters—an officer in the Reserve—was killed in the Franco-German War. In honour of his memory a service was held in the school, and so great was the hatred of the boys for this gentleman—*et hoc genus omne*—that this ceremonial was to them a veritable *jour-de-fête*.

A change has been attempted; but so far the meed of success has not been great. Nor can it be great, says Curt Abel in conclusion, for 'as long as those in power object to free, thinking, independent citizens, German boys will not be allowed to enjoy their school life.

Even allowing that only a tithe of the above is solid fact, and remembering that a posse of French educationists not long ago visited us for the purpose of studying public school outdoor games, it really does seem as though this befogged little island has made greater advances towards that self-development, which proceeds from physical training, than those States which are so frequently held before our eyes as models according to which we should mould our conduct, and that English games are more valuable than German Gymnastics and Swedish drill.

SCIENCE NOTES.

THE HELIOCHROMOSCOPE AND COLOUR PHOTOGRAPHY.—In the system of composite heliochromy of Mr. F. E. Ives, by means of a compound camera front three photographic negatives of the object are made by simultaneous and equal exposure from the same point of view, and upon the same sensitive plate. The photographic plate is sensitive to all colours of light, but by introducing light filters one of the negatives is made by such light rays only as excite the fundamental red sensation and in due proportion; another by light rays as they excite the fundamental green sensation, and another by light rays as they excite the fundamental blue-violet sensation. From this triple negative, a triple lantern slide is made, which, although it shows no colour, contains such a graphic record of the natural colours that, in order to reproduce them to the eye, it is sufficient to superpose the three images—one with red light, one with green, and one with blue-violet. This can be done in two ways. Mr. Ives has invented for the purpose a helio-chromoscope, which is about the size of a hand stereoscope, and is used in much the same way. Projection with a special optical lantern having three optical systems, with red, green, and blue glasses, may also be resorted to. The three images, being exactly superposed, appear as one only, in which the natural colours are reproduced, together with the light and shade, while images of three ordinary photographs exactly alike, if superposed in the same way through the same coloured glasses, would show no colour at all.

***

SILICA IN PLANTS.—Some interesting experiments have recently been instituted by MM. Berthelot and André as to the proportion of silica which exists in plants at different stages in their development, and the mode in which it occurs. Grains of wheat, which contain scarcely a trace of silicic acid, were sown on the 15th of April. On April 30 the greater part of the silica contained in the stem was found to be in the insoluble condition, and must, therefore, have undergone a transformation since its absorption; while on June 12 the chief part of the silica was soluble in alkalies. On June 30, at the commencement of the blossoming period, the proportion of silica present was largest in the leaves, and chiefly in the insoluble condition, while it was smallest in the in florescence, where it occurred in the soluble condition. Some dried plants examined on August 18 showed that the amount of silica had increased considerably in the stem and leaves, but only slightly in the ear.

***

THE OLFACTOMETER AND THE SENSE OF SMELL.—It is a matter of common observation that the sense of smell varies in different persons. The degree of this variation can now be measured by the olfactometer of M. Henry, lately exhibited at a meeting of the French Academy of Sciences. This device for testing the smelling powers consists of a glass stem, which is dipped into an odoriferous liquid and inserted into a paper sleeve. The odour then diffuses through the paper, and as the rate of diffusion is known, the quantity of odorous vapour in a volume of air can easily be ascertained. The pleasanter the scent, the greater is the proportion required to produce an effect on the olfactory nerve.

***

THE ABSORPTION OF FREE NITROGEN BY PLANTS.—It has been a subject of much discussion whether soil containing humus has the power of absorbing free nitrogen, and whether plants of other natural orders than Leguminosae can under any circumstances avail themselves of atmospheric nitrogen. Special interest attaches, therefore, to a series of experiments recently instituted by MM. T. Schloesing and E. Laurent. The plants experimented on were grown in closed cylinders communicating with a series of Sprengel pumps, and were supplied with a mixture of pure nitrogen, oxygen, and carbon dioxide. A known volume of nitrogen having been introduced at the beginning, any fixation of this gas by the plants during growth was estimated by directly measuring the volume remaining when growth had ceased; the nitrogen in the soil and seeds being determined before growth, and again at the end of the experiments in soil and plants, separately, to check these results. It was found that wherever fixation took place, the amount of gaseous nitrogen which disappeared coincided with that gained by the plants. Experiments with members of the Leguminosae led to the conclusion that leguminous plants can largely make use of the free nitrogen of the air, but only under microbe influence, passing on this nitrogen into their substance in a state of combination. In the case of sterilized soil, to which no microbe washings were supplied, no bacteroid nodules were formed and no nitrogen was fixed. Other experiments with Jerusalem artichoke, oat, and tobacco, as well as with natural soils without plant-growth, showed a marked fixation of gaseous nitrogen both by plants and soil, but wherever this was noticed the surface of the soil was covered with a growth of small green cryptogamic plants, including one or two Mosses and several Algae (*Conferva*, *Oscillaria*, and *Nitzschia*). It was found, too, that where the soil had gained in nitrogen the gain was confined to the upper layer containing these Algae. When, using similar soils and plants, the growth of Algae was prevented and their action eliminated by covering the surface of the soil (after sowing the seeds) with a layer of recently ignited quartz sand, there was no appearance of algal growth, and simultaneously no fixation of nitrogen either by plants or soils. It appears, therefore, that soils free from organisms do not fix any appreciable amount of nitrogen.

***

THE POISON OF FROGS AND TOADS.—The Chinese are accustomed to procure batrachian poison by prodding a toad in a jar containing flour. Kobert's method of obtaining it is by the subcutaneous injection of a small dose of chloride of barium, which causes, after a few minutes, such a profuse secretion of the poison, that the animal appears to be coated by whitewash. A small frog, *Dendrobate tinctorius*, is used by the Indians of Colombia for poisoning their arrows, the animal being exposed to the heat of a fire, after the fashion of a goose of Strasburg, to cause it to exude the poison. A single frog will yield sufficient for fifty arrows. *Dendrobate tinctorius* derives its name from its capacity of altering the colour of parrots' feathers. When some of the feathers are removed and an injection made of the frog's blood beneath the skin, the new feathers grow of a yellow or greenish tint on these spots.

***

THE PHYSIOLOGY OF DEVELOPMENT IN TUBERS.—M. Prunet has recently been conducting some interesting experiments into the difference in time of the development of potato buds. Buds on the upper parts of potato tubers are found to develop earlier and more

rapidly than those near the base, while the anterior halves, as shown by cultivating them separately, yield more abundant crops than the posterior halves. M. Prunet, working on three distinct varieties of potatoes, found that the anterior portions of unsprouted potatoes were generally the richer in carbo-hydrates, nitrogenous substances, organic acids and phosphates. In germinated tubers, the differences in proportion were more strongly marked. Thus, in potato tubers, there is always a close relation between the distribution of the immediate principles and mineral substances, and the relative aptitude of the buds to develop.

***

ARTIFICIAL BLOOD ORANGES.—M. Barillé points out that many of the so-called 'blood' oranges that are offered for sale are coloured artificially. When opened, their pulp has been discovered to be free from the red colour which characterises this variety, while the rind has been artificially coloured by the vendor. The pigment used, on microscopical examination of a section of the epicarp, showed a violet tinge. It was localised in the glands, and did not pass beyond the cuticle. At certain points, where it had accumulated near the glands, the colour was dark red. The colouring matter employed is stated to be the scarlet of Biebrich, a nitro-derivative of amidoazobenzol, which is applied in aqueous solution and is not poisonous.

***

LIME IN THE SALIVA.—In perfectly normal cases, from two to three per cent. of lime is present in human saliva. More is present a few hours after a meal than just before, or just after it, and an increase of from one to three per cent. takes place when any of the teeth are affected by caries. A still larger proportion (six to nine per cent.) occurs in the saliva of persons who have lost all their teeth.

***

THE CHEMICAL RELATIONS OF RESINS AND TANNINS.—Some observations recently made by Heckel and Schlagdenhauffen on plants belonging to the genera *Gardenia* and *Spermolepis*, tend to show an interesting chemical relationship between resins and tannins, certain resins examined by them having shown an evident transition between tannins and resins. In certain species of *Gardenia*, natives of New Caledonia, a resinous substance protecting the leaf buds occurs abundantly, and is much used by the natives for medicinal and economic purposes. Its analysis forms a remarkable contrast to those furnished by other resins, such as copal, myrrh, sandarac, etc., and as striking a resemblance to the analyses of different kinds of tannins. The resin accords most completely in its constitution with cinchotannic acid, also a product of the Rubiaceae. An abundant excretion from *Spermolepis gummifera*, which Heckel and Schlagdenhauffen suggest would be more correctly named *S. tannifera*, appears to be a tanno-resinous substance formed in the wood at the expense of some of the ligneous cell-walls. It contains about eighty per cent. of gallo-tannic acid, and the resin present is closely akin to tannin in its constitution.

***

A NEW ANTISEPTIC.—A valuable antiseptic, diaphterin, has lately been the subject of experiments by Professor Emmerich, of Munich. It is a yellow powder, readily soluble in water, and comparatively non-poisonous, 0·25 gramme being administered subcutaneously to guinea-pigs without noticeable prejudicial effects. When applied to wounds, diaphterin does not lose its antiseptic qualities as some other phenolic substances do. On the contrary, its action is augmented.

—o—

MODEL ANSWERS TO SCHOLARSHIP QUESTIONS, JULY, 1892.

Write in large hand, as a specimen of Penmanship, the word—
Fortuitous.

Write in small hand, as a specimen of Penmanship—
A soothsayer bids you beware the ides of March.

Dictation.

Write the passage dictated to you by the Examiner.

Whoever records the transactions | of any of the more considerable | European states | during the last two centuries, | must write the history of Europe. | Its various kingdoms | throughout that period | have been formed into one great system, | so closely united, that each | holding a determinate station, | the operations of one are so felt by all, | as to influence their counsels | and regulate their measures. | But previous to the fifteenth century, | unless when | vicinity of territory | rendered the occasions of discord | frequent and unavoidable, | or when national emulation | fomented or embittered | the spirit of hostility, | the affairs | of different countries | are seldom interwoven | with each other. | In each kingdom of Europe | great events and revolutions | happened, | which the other powers | beheld with almost | the same indifference | as if they had been | uninterested spectators, | to whom the effect | of those transactions | could never extend. |

Arithmetic.

WOMEN CANDIDATES.

Wednesday, July 6th, 10 to 1.

Candidates may not answer more than *twelve* questions in all, of which *one* at least must be chosen from the last *three*. If you answer more than twelve questions, only the twelve answers coming first on your paper will be revised.

The solutions must be given at such length as to be intelligible to the Examiner, otherwise the answer will be considered of no value.

1. Express, in fractions, the relation of 7 miles 4 fur. 30 poles to 9 miles 1 fur. 25 poles 2 yards 1 ft. 6 in.

$$\frac{\text{7 miles 4 fur. 30 poles}}{\text{9 miles 1 fur. 25 poles 2 yards 1 ft. 6 in.}} = \frac{\text{60 fur. 30 poles}}{\text{73 fur. 25 poles 2}\tfrac{1}{2}\text{ yards}}$$

$$= \frac{2430 \text{ poles}}{2945 \text{ poles } 2\tfrac{1}{2} \text{ yards}} = \frac{26730 \text{ half yards}}{32400 \text{ half yards}} = \frac{2673}{3240} = \frac{297}{360} = \frac{33}{40} = \cdot 825.$$

Ans. $\frac{33}{40}$ and ·825.

The student should note the 'catch' in the word '*fractions.*'

2. Find the least common multiple of 12, 64 80, 96, 120, and 160.

L. C. M. of 12, 64, 80, 96, 120, 160 =
L. C. M. of 64, 96, 120, 160.
Now 64, 96, 120, 160 =
2^6, $2^5 \times 3$, $2^3 \times 3 \times 5$, $2^3 \times 5$
∴ L. C. M. = $2^6 \times 3 \times 5 = 960$ Ans.

3. The sum of two numbers is $5\frac{3}{5}$; the smaller is $2\frac{3}{8}$, what is the greater?

$$\frac{27}{5} - \frac{21}{8} = \frac{216 - 105}{40} = \frac{111}{40} = 2\tfrac{31}{40}. \text{ Ans.}$$

4. Find the value of 51 bushels 1 peck 1 gal. 3 qts. at £1 3s. 9½d. per peck.

51 bushels 1 peck 1 gal. 3 qts. = 206 pecks minus 1 qt.

	£	s.	d.	
	1	3	$9\frac{1}{2}$	= cost of 1 peck.
			206	
1 qt. of 1 peck = ¼	244	16	$6\frac{1}{2}$	= cost of 206 pecks.
	2	$11\frac{3}{4}\frac{1}{2}$		= " " 1 qt. (minus).
Ans.	244	13	$6\frac{7}{8}$	= " " 205 b. 1 p. 1 g. 3 q.

5. A tradesman bought 451 articles at £3 15s. 7d. each, paid £3 13s. 4d. for the carriage, and sold them at £4 7s. 7½d. each. How much did he gain?

	£	s.	d.		£	s.	d.
	451	0	0				
			3				
	1,353	0	0	Cost at	3	0	0
10s. of £1 = ½	225	10	0	" "	0	10	0
5s. of 10s. = ½	112	15	0	" "	0	5	0
6d. of 5s. = 1/10	11	5	6	" "	0	0	6
1d. of 6d. = ⅙	1	17	7	" "	0	0	1
	1,704	8	1	" "	3	15	7

	£	s.	d.
	451	0	0
			4
	1,804	0	0
5s. of £1 = ¼	112	15	0
2s. 6d. of 5s. = ½	56	7	6
7½d. of 2s. 6d. = 1/10	2	16	4½
	1,975	18	10½

	£	s.	d.
Cost at	4	0	0
„ „	0	5	0
„ „	0	2	6
„ „	0	0	1½
„ „	4	7	7½

Total cost = £1,704 8s. 1d. + £3 13s. 4d. = £1,708 1s. 5d.
Profit = £1,975 18s. 10½d. minus £1,708 1s. 5d. =
£267 17s. 5½d. Ans.

6. Simplify—

$$\frac{(1\frac{1}{2} - 3\frac{1}{4}) \text{ of } (\frac{4}{13} - \frac{3}{16})}{\frac{5}{6} + \frac{1}{2} - 1\frac{1}{12}}$$

$$\frac{\left(\frac{15}{8} - \frac{13}{4}\right) \times \left(\frac{4}{13} - \frac{3}{16}\right)}{\frac{17}{18} - \frac{13}{14}} = \frac{-\frac{11}{8} \times \frac{25}{208}}{\frac{1}{63}} = -\frac{11}{8} \times \frac{25}{208} \times \frac{63}{1}$$

$$= -\frac{17325}{1664} = -10\frac{725}{1664}. \text{ Ans.}$$

The introduction of minus quantities is worthy of attention.

7. Simplify 2·749 of ·2$\dot{5}\dot{4}$ of ·190476 of £2 10s.

$$2\frac{3}{4} \times \frac{252}{990} \times \frac{190476}{999999} \times \frac{50}{1}\text{s.} = \frac{11}{4} \times \frac{14}{55} \times \frac{4}{21} \times \frac{50}{1}\text{s.} = \frac{20}{3}\text{s.}$$

$$= 6\text{s. } 8\text{d. Ans.}$$

8. Find the difference between 11·5 of ·6 of £3 7s. 9d. and 2⅗ of £27 8s. 6½d.

$$\frac{13}{5} \text{ of £27 8s. } 6\tfrac{1}{2}\text{d. } \textit{minus } \frac{23}{\cancel{5}_1} \times \frac{\cancel{3}^1}{\cancel{3}_1} \text{ of £3 7s. 9d.} =$$

£5 9s. 8½d. × 13 *minus* £1 2s. 7d. × 23 =
£71 6s. 2½d. *minus* £25 19s. 5d. =
£45 6s. 9½d. Ans.

9. If 3 cwt. 1 qr. 15 lbs. cost £10 17s. 6d., what should be the cost of 7 cwt. 3 qr. 12 lbs.?

3 cwt. 1 qr. 15 lbs. = 379 lbs.
7 cwt. 3 qr. 12 lbs. = 880 lbs.
£10 17s. 6d. = 2610d.
Cost of 379 lbs. = 2610d.
„ 1 lb. = $\frac{2610}{379}$d.
„ 880 lbs. = $\frac{2610 \times 880}{379}$d. = $6060\frac{420}{379}$d. = 505s.
$- 0\frac{420}{379}$d.
= £25 5s. $0\frac{420}{379}$d. Ans.

10. If a person sells, for £18 each, fifty £10 shares in a company which pays a dividend of 8 per cent., and then invests the proceeds of this sale in the purchase of £5 shares in another company at £3 10s. each, find what difference is made in his income if the second company pays a dividend of 3½ per cent.

(*a*) First income = £500 at 8 per cent. = £40.
(*b*) Cash received for shares = £18 × 50 = £900.
(*c*) Stock bought for £7/2 = £5.
„ „ £1 = £5/2 × 2/7 = £5/7.
„ „ £900 = £$\frac{10}{7} \times \frac{900}{1}$ = £$\frac{9000}{7}$
(*d*) Second Income = £$\frac{9000}{7} \times \frac{7}{2} \times \frac{1}{100}$ = £45.
(*e*) ∴ Difference of Income = £45 − £40 = £5. Ans.

11. A and B can reap a field in 10 days, A and C in 12 days, B and C in 15 days. They all work together for 4 days, when A leaves: B and C work together for 6 days more, when B leaves. In how many days will C be able to finish the work?

(*a*) Fraction of field reaped in one day by A + B = 1/10
„ „ „ A + C = 1/12
„ „ „ B + C = 1/15
∴ „ „ „ 2 (A + B + C) = 1/10 + 1/12 + 1/15 = 1/4
∴ „ „ „ A + B + C = 1/8
(*b*) Work done in 4 days by A + B + C = 1/8 × 4/1 = ½ of field.
„ 6 „ B + C = 1/15 × 6/1 = 2/5 „
Total work hitherto done = ½ + 2/5 = 9/10 „
∴ Fraction remaining to be done = 1 − 9/10 = 1/10 „
(*c*) Work done in 1 day by A + B + C = 1/8
„ „ „ A + B = 1/10
∴ „ „ „ C = 1/8 − 1/10 = 1/40
(*d*) ∴ Days required for C to do 1/10 = 1/10 ÷ 1/40 = 4 days. Ans.

12. What is the principal which will yield £14 2s. 6d. interest in 219 days at 4 per cent.?

The question fully stated is:—

If £100 in 365 days yield £4, what principal will in 219 days yield £14 2s. 6d.?

Principal required to yield £4 in 365 days = £100
„ „ £1 in 1 day =
£$\frac{100}{4} \times \frac{365}{1}$ = £$\frac{36500}{4}$
„ „ £14⅛ in 219 days =
£$\frac{36500}{4} \times \frac{113}{8} \times \frac{1}{219}$ = £$\frac{14125}{24}$ = £588 10s. 10d. Ans.

13. What is the difference between the simple and the compound interest on £1,350, for 3 years at 5 per cent.?

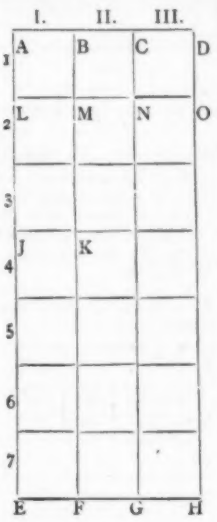
(*a*) Simple Interest = £$\frac{1350 \times 3 \times 5}{100}$ = £$\frac{135 \times 3 \times 5}{10}$ =
£$\frac{135 \times 3}{2}$ = $\frac{£405}{2}$ = £202 10s.

(*b*) Compound Interest—
First Year's Interest = £1350 × 1/100 = £1350 × 1/10 = £67 10s.
Second Year's Principal = £1350 + £67·5 = £1417·5
„ „ Interest = £1417·5 × 1/20 = £70·875.
Third „ Principal = £1417·5 + £70·875 = £1488·375
„ „ Interest = £1488·375 × 1/20 = £74·41875
Total interest in Three Years =
£67·5 + £70·875 + £74·41875 = £212·79375.
(*c*) ∴ Difference of Interest = £212·79375 − £202·5 =
£10·29375 = £10 5s. 10½d. Ans.

14. Say how you would *prove* to a class of children—
(*a*) That five times six are the same as six times five.
(*b*) That one-seventh of three is the same as three-sevenths of one.
(*c*) That if A is ⅔ of B, B is 3/2 of A.

(*a*)

1	1	1	1	1	1st five
1	1	1	1	1	2nd „
1	1	1	1	1	3rd „
1	1	1	1	1	4th „
1	1	1	1	1	5th „
1	1	1	1	1	6th „
5th =	4th =	3rd =	2nd =	1st Six	5 × 6 = 30 6 × 5 = 30 ∴ 5 × 6 = 6 × 5



(*b*) Draw a rectangle ADHE, 3 ins. by 7 ins., and let this denote three,

Then ABFE will denote one,

Also ADOL = ⅓ of 3,

Also ABKJ = ⅓ of 1,

But ADOL = ABKJ,

∴ ⅓ of 3 = ⅓ of 1.

Q.E.D.

(*c*) A = five-ninths of B.

Then nine times A = forty-five ninths of B = five times B.

Then nine-fifths of A = five-fifths times B.

Then nine-fifths of A = B.

Q.E.D.

15. Demonstrate that whenever four numbers are in proportion, the product of the first and fourth terms *must* be equal to the product of the second and third.

Example. As 3 : 4 :: 27 : 36

Then 3 × 36 will = 4 × 27.

Reason.—The reciprocal of a fraction is that fraction inverted, where the numerator and denominator of the reciprocal are respectively equal to the denominator of the original fraction.

It is evident, therefore, that the product of a fraction and its reciprocal equals unity.

Now we have $\frac{4}{3} = \frac{27}{36}$, so that $\frac{36}{27}$ = reciprocal of $\frac{4}{3}$.

∴ $\frac{36}{27} \times \frac{4}{3} = \frac{108}{81}$ = Unity. Q.E.D.

16. Explain why the words 'borrowing' and 'carrying' are often misused in teaching subtraction, and show, by the help of an illustration, what is the best way of making the meaning of that rule intelligible to young children.

The terms '*borrowing*' and '*carrying*' (*paying back*) are sometimes unscientifically used in subtraction, because the 'borrowing' is from one line, and the paying back to the other.

It is vitiating to the child-mind because it professes to give a reason for the process which is not a true one, and which is not even consistent with itself in its various parts.

The best method of teaching subtraction is by *equal additions*, and its fundamental axiom is :—

If to each of two numbers an equal number be added, the difference of the original numbers equals the difference of the compounded numbers. Thus 7 − 3 = 4, and (7 + 5) − (3 + 5) = 4.

Example.—

		H.	Tens.	Units.
618 Minuend.		6	11	18
249 Subtrahend.	=	3	5	9
369 Difference.		3	6	9

Here we have, in the second form of the same, added to the Minuend 10 more tens and 10 more units ; and we have also added to the Subtrahend 1 more hundred and 1 more ten. But as 10 tens + 10 units = 1 hundred + 1 ten ; therefore the difference 369 is constant.

Music.

MEN AND WOMEN CANDIDATES.

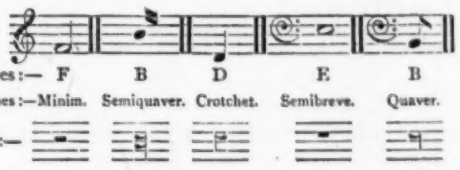
Thursday, July 7th, 12.15 to 1.

The Tonic Sol-fa questions immediately follow those of the Staff Notation. Candidates must keep ENTIRELY to one set of questions or the other. *You are not permitted to answer more than FIVE questions.*

If you answer more than five questions, only the five answers coming first on your paper will be revised.

STAFF NOTATION.

1. Write the pitch names (C, B, etc.) and the duration names (crotchet, etc.) of the following notes, and write the signs for rests of corresponding value :—



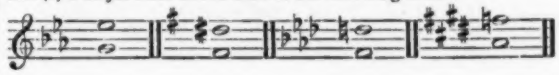
Pitch names :— F B D E B

Duration names :—Minim. Semiquaver. Crotchet. Semibreve. Quaver.

Rests :—

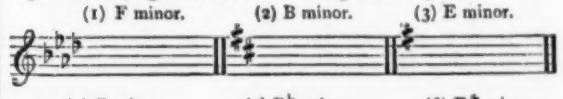
2. Write (*a*) a perfect or major fourth above each of the following notes :—

and (*b*) a major sixth above each of the following notes :—

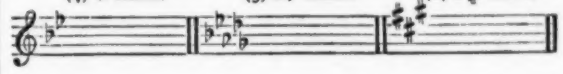


3. Write the signatures of the following minor keys :—

(1) F minor. (2) B minor. (3) E minor.

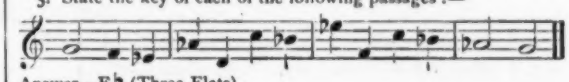


(4) G minor. (5) B♭ minor. (6) F♯ minor.

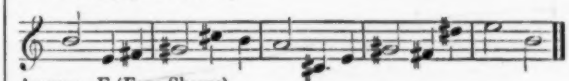


4. Re-write the following in $\frac{4}{4}$ time, doubling the value of every note and rest :—

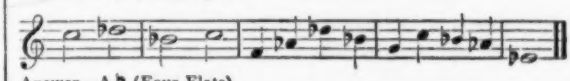
5. State the key of each of the following passages :—



Answer—E♭ (Three Flats).



Answer—E (Four Sharps).



Answer—A♭ (Four Flats).

6. Explain (briefly) the following terms :—

(1) Pianissimo. Very soft.
(2) Staccato. Each note short and distinctly marked.
(3) Mezzo Piano. Rather soft.
(4) Forte. Loud.
(5) Rallentando. Slackening pace.
(6) Dolce. Sweetly.

TONIC SOL-FA NOTATION.

The Staff Notation questions immediately precede those of the Tonic Sol-fa Notation. Candidates must keep ENTIRELY to one set of questions or the other. *You are not permitted to answer more than FIVE questions.*

1. Re-write the following:—(1) Doubling the value of every note and rest, and (2) again, halving the value of every note and rest:—

s :- .s	m :r	m :	d :—

Double value.

s :—	—: s	m :—	r :—
m :—	:	d :—	— :—

Half-value.

s., s: m. r	m: : d	:	:

2. Write (in figures) very distinctly over each note and rest in the following passage its value in pulses or fractions of a pulse:—

s :-.f.l	s .f :m .	t_1,d .r :m .,s	.r,t_1 :d .

3. Describe the intervals (major third, etc.) formed by the following pairs of notes:

(1)	(2)	(3)
m'	t	t
Major Sixth.	Major Seventh.	Perfect Fifth.
s	d	m
(4)	(5)	(6)
f	s	s
Major Sixth.	Major Third.	Imperfect Fifth.
se_1	re	de

4. If the first note of each of the following passages is regarded as *ray*, what will the others become?

(*a*) l fe s d' m r fe l t d' fe l s
Ans. r t_1 d f l_1 s_1 t r m f t_1 r d

(*b*) s f ta l m f d' ta r' f ta l
Ans. r d f m t_1 d s f l d f m

5. Which one of the following tones is highest in pitch, and which one lowest?

(*a*) f in Key C is F.
(*b*) r in Key G is A.
(*c*) l in Key B♭ is G. Highest in Pitch.
(*d*) f_1 in Key A is D.
(*e*) t_1 in Key D is C♯. Lowest in pitch.
(*f*) s in Key F is C.
(*g*) r' in Key E♭ is F'.

6. Explain (briefly) the following terms:—

(1) Pianissimo. Very soft.
(2) Staccato. Each note short and distinctly marked.
(3) Mezzo Piano. Rather soft.
(4) Forte. Loud.
(5) Rallentando. Slackening pace.
(6) Dolce. Sweetly.

Grammar and Composition.

WOMEN CANDIDATES.

Wednesday, July 6th, 2.30 to 5.

All candidates *must* answer questions 1 and 2, and may select *four*, but not more, of the remaining eight questions.

If you answer more than *six* questions, only the *six* answers coming first on your paper will be revised.

No abbreviation of less than three letters is to be used in Parsing or Analysis.

1. Write a short essay on—A general election. OR,
Give in substance the contents of any interesting book which you have recently read.

1. *A general election* is the occasion when the various constituencies into which the British Isles are divided, decide what persons shall represent them in the Imperial Parliament.

In order that no undue influence may be exercised, the voting is by ballot, and may be confidently asserted to be absolutely secret.

Ordinarily, at a general election, a severe party struggle takes place, and the result turns upon the confidence reposed by each constituency in the policy of a party as a whole, and its local candidate in particular.

Under the Septennial Act, a *general election* must take place at least every seven years, but the average duration of Parliaments is much shorter than the period mentioned.

Every qualified citizen ought to take part in a *general election* and (whilst exhibiting no intolerance towards those whose views and actions are opposed to his own) should strenuously strive to return to Parliament that candidate whose policy will best benefit the Empire and his own constituency.

A great moral responsibility depends upon each voter. By his suffrage he may assist in promoting the happiness of millions, the flow of commerce, the spread of enlightenment, and the advance of civilization; or he may incur the guilt of unjust wars, the crime of unprovoked aggression, and the regret resulting from the loss of national honour.

Every true-hearted Englishman will fervently pray that the time may be far distant when his fellow countrymen will lightly regard the responsibilities devolving upon them at a *general election*; and with equal intensity promote the maintenance of those patriotic and imperial ideas which cause each British voter to regard himself as a sentinel guarding the interests, not only of his Fatherland, but of an empire teeming with countless millions, and over which the sun never sets.

2. Analyse the following passage, and parse the words printed in italic:—

I *proceeded* towards London on a fine morning, no *way* uneasy about to-morrow, but *cheerful* as the birds *that* carolled by the road; and comforted *myself* with *reflecting* that London was the *mart where* abilities of every kind were *sure* of meeting distinction and reward.—GOLDSMITH.

SENTENCE	KIND OF SENTENCE	SUBJECT		PREDICATE		OBJECT	
		Simple	Enlargement	Simple	Extension	Simple	Enlargement
A. I proceeded towards London .....carolled by the road	Principal	I		proceeded	towards London.... by the road		
That carolled by the road	Adj. Qual. *birds*	that		carolled	by the road		
B. And comforted myself..... distinction and reward	Principal Co-ordinate with A	[I]	(and)	comforted	with reflecting.... and reward	myself	
London was the mart where abilities of every kind were sure of meeting.....reward	Noun, gov. by *reflecting*	London		was the mart..... and reward			
Where abilities of every kind were sure....and reward	Adj. Qual. *mart*	abilities	of every kind	were sure of meeting.... and reward			

proceeded—verb, reg. (weak), intrans., indic., past definite, sing., 1st, agree with its subj. *I* (*a*).

way—common noun, sing., 3rd, neut., obj. adverbial, modifying *uneasy*.

cheerful—adjective of quality, posit., used attributively, qual. *I*.

that—rel. pronoun, plural, 3rd, com., nom., subj. to *carols* and agrees with its antec. *birds* (*b*).

myself—pers. pronoun, reflexive, sing., 1st, obj., gov. by *comforted* (*c*).

reflecting—gerund., sing., 3rd, neut., obj., governed by *with* and governing following noun sentence (*d*).

mart—common noun, sing., 3rd, neut., nom., subject after *was* (*e*).

where—connect. adv. of place, mod. *meeting* and joins two sentences.

sure—adj. of qual., posit., used predicatively, qual. *abilities*.

(*a*) A finite verb agrees with its subject in number and person.

(*b*) A relative pronoun agrees with its antecedent in number, gender, and person.

(*c*) The objective case is governed by transitive active verbs.

(*d*) Transitive gerunds may both govern and be governed.

(*e*) Copulative verbs take the same case after as before them.

3. Paraphrase the following passage :—

Ah ! what avail the largest gifts of Heaven,
When drooping health and spirits go amiss ?
How tasteless then whatever can be given !
Health is the vital principle of bliss,
And exercise of health. In proof of this,
Behold the wretch who wastes his life away,
Soon swallowed in disease's sad abyss ;
While he whom toil has braced, or manly play,
Has light as air each limb, each thought as clear as day.
—THOMSON.

The most splendid endowments bestowed by Providence are of little use, and the greatest prosperity unenjoyable, unless accompanied by soundness of body and cheerfulness of mind.

To secure happiness we must be healthy, and to be healthy we must exert our faculties.

Sad exemplifications of this truth are afforded by those miserable beings who fritter away their existence. Them sickness soon plunges into its sorrowful depths.

But to the hardy worker, or the athlete, mere living is a pleasure, felt throughout his frame ; and his reason is lucid and active.

4. Give some examples, such as would be useful in teaching scholars in the Fourth Standard :—

(1) Of the same word used both as a noun and as an adjective.

(2) Of the same word used both as a verbal noun and as a participle.

(3) Of the same word used both as a conjunction and as a preposition.

NOUN.	ADJECTIVE.
1. (*a*) *Iron* is a mineral	He passed by the *iron* gate
(*b*) The *poor* he succoured	'Tis a *poor* thing
(*c*) Let there be *light*	The load is very *light*
VERBAL NOUN.	**PARTICIPLE.**
2. (*a*) *Whistling* in company is rude	He, *whistling* a merry tune, paid no attention
(*b*) Eloquent *speaking* is rare	*Speaking*, he sheathed his good sword
PREPOSITION.	**CONJUNCTION.**
3. (*a*) *Notwithstanding* this, he departed	He crossed the stream, *notwithstanding* that I forbade him
(*b*) He stood *before* the king	The boy died *before* the doctor arrived

5. Take the following words :—

Rest, Fort, Honour, Solid,
Scribe, Person, Firm, Light,

put to each of them some prefixes and affixes, and explain how these additional syllables have altered the meaning of the root word.

Rest	A.S., raest	*Unrest*ful	Not at all in a settled state.
Fort (= strong)	Latin, fortis	*Com*fort*able*	Being in a state of moderate (not strong) enjoyment.
Honour	Latin, honor	*Dis*honour*able*	Not worthy of honour.
Solid	Latin, solidus	*Con*solid*ate*	To join various items into one whole.
Scribe	Latin, scribo	*Inscription*	A writing in or on anything.
Person	Latin, persona	*Im*person*ate*	To represent things as persons.
Firm (strong)	Latin, firmus	*Infirmary*	A place for the not strong, the invalid.
Light	A.S., liht	*Enlighten*	To illuminate.

6. Amplify this sentence :—

The sun shines

(1) by an adverb ; (2) by an adverbial phrase, and (3) by an adverbial sentence ; and explain, as to a class of children, the difference between these three.

(1) The sun shines *continuously*.

(2) The sun shines *without intermission*.

(3) The sun shines *as constantly as time endures*.

In case (1) a single word serves to modify.

In case (2) the prepositional phrase is adverbial and equals '*non-intermittently*.'

In case (3) the adverbial sentence modifies, but also institutes a comparison with, another assertion.

7. Explain the *case* of the words printed in italic in the following sentences :—

(*a*) He gave me *what* I wanted

(*b*) The book is *mine*.

(*c*) *Him* the Almighty power
Hurled headlong.

(*d*) He *whom* thou lovest is sick.

(*e*) He was chosen *secretary*.

(*f*) *Weather* permitting, I shall travel to-morrow.

(*a*) *What* is obj. case, governed by '*wanted*,' and the object of the verb *gave* is the following sentence.

(*b*) *Mine* is nom. case, subject after the copulative verb *is*. The possessive idea is in the word itself, and not in its syntactical use.

(*c*) *Him* is obj. case, governed by *hurled*. It is placed first for emphasis' sake.

(*d*) *Whom* is obj. case, governed by *lovest*. The case does not depend upon the antecedent *he*, but upon its use in its own sentence.

(*e*) *Secretary* is obj. case, governed by the verb *was chosen*. Verbs which in the active voice take two objects of different kinds, when placed in the passive voice take one of the original objects for the new subject, and retain the other in the obj. case.

(*f*) *Weather* is nom. abs., denoting condition or hypothesis, and this construction is employed instead of using the adv. sentence '*If* the weather permit.'

8. Give examples from any poem you have read or learned (1) of simile ; (2) of metaphor ; (3) of personification.

(1) *Simile* :—

'The gray-hooded even
Like a sad votarist in palmer's weed,
Rose from the hindmost wheels of Phœbus' wain.'
(*Comus*, 188-190.)

(2) *Metaphor* :—

'*Bridle* on thy headlong wave.' (*Comus*, 888.)

(3) *Personification* :—

'O welcome pure-eyed *Faith*, white-handed *Hope*,
Thou hovering angel girt with golden wings,
And thou unblemished form of *Chastity*.' (*Comus*, 213-215.)

9. Say what a passive verb is, and how you recognise it, and give some examples of its use.

(*a*) A passive verb is a transitive verb whose subject is not the Doer.

(*b*) It can be recognised both from the above definition and from its form, for it is always compounded of some part of the verb to be and the *past* participle. 'The rose-tree *is being planted* by Mary.' 'Harold *was defeated* by William.' 'The town *has been surrendered*.'

(*c*) Intransitive verbs of motion take in their perfect tense a passive form, *e.g.*, '*He is gone*,' but these are not true passives.

10. Name any important books which were written in the eighteenth century, and say what you know of the authors of any two of them.

(*a*) *Books.*	*Authors.*
'Analogy of Religion.'	Bishop Butler.
'Lives of the Poets.'	Samuel Johnson.
'History of England.'	David Hume.
'Wealth of Nations.'	Adam Smith.
'Vicar of Wakefield.'	Oliver Goldsmith.
'Reflections on French Revolution.'	Edmund Burke.
'Decline and Fall of the Roman Empire.'	Edward Gibbon.
'Tam o' Shanter,' etc.	Robert Burns.

(*b*) *Oliver Goldsmith* was born near Longford in 1732, and after some desultory study entered Trinity College, Dublin, whence, however, he departed without graduating. He travelled on foot over a considerable portion of Europe, depending for subsistence upon his flute-playing. This rambling bore fruit in the publication of 'The Traveller.' He was for a time usher at a school in Camberwell, and he vainly endeavoured to take 'holy orders.' His life was one struggle against poverty, caused mainly by his dissipation, imprudence, and thoughtless generosity. More than once he was imprisoned for debt, but was released by such literary and personal friends as Dr. Johnson. He wrote 'The Citizen of the World,' 'The Traveller,' 'The Deserted Village,' 'The Good-Natured Man,' 'She Stoops to Conquer,' and 'The Vicar of Wakefield.' He died in 1774, aged 42, and was buried in 'the Temple.'

(*c*) *Dr. Samuel Johnson* was born at Lichfield in 1709. When a child he was 'touched' by Queen Anne in order to be cured of scrofula. After a youth of hardship and classical study he entered Pembroke College, Oxford, in 1727, but departed in 1731 without a degree, through the compulsion of poverty. He tried school-keeping for a time, but with no conspicuous success, and in a short time went to London with one of his pupils, the afterwards famous actor, David Garrick. Here for many years he nobly and yet furiously endured pitiful contempt, disease, and poverty, but lived to become the '*Great Cham of Literature*' at about the age of 53. In 1762 he was awarded a pension, and eleven years afterwards, in company with his friend and biographer, Boswell, he visited the Hebrides. After another eleven years he died, aged 75, and was buried in Westminster Abbey. He founded two periodicals, 'The Rambler' and 'The Idler'; wrote an Eastern tale, 'Rasselas'; two poems, 'London' and 'The Vanity of Human Wishes'; a play, 'Irene'; and 'The Lives of the Poets.' His personality and eccentricity were marked, his conversational powers exceedingly brilliant and solid, and his piety and benevolence sincere and profound.

French.

WOMEN CANDIDATES.

Friday, July 8th, 4 to 6.

1. Translate into English:—

(*a*) Cependant une femme *s'approcha* pour l'interroger. Prascovie raconta l'affreuse nuit qu'elle avait passée dans le bois; d'autres paysans s'arrêtèrent pour l'entendre. Le starost du village examina son passe-port, et declara qu'il était en règle: alors la bonne femme *attendrie* lui offrit sa maison; mais lorsque la voyageuse *voulut* se soulever, ses membres étaient tellement engourdis qu'on fut obligé de la soutenir. Elle avait perdu un de ses souliers, elle montra son pied *nu* et ses jambes enflées. Elle tâchait, pendant le séjour qu'elle y faisait, de se rendre utile, en balayant la maison, en lavant le linge ou en *cousant* pour ses hôtes.

(*b*) L'étude approfondie du monde ramène toujours *ceux* qui l'ont faite avec fruit à paraître simples et sans prétentions: en sorte que l'on travaille quelquefois longtemps pour arriver au point par où l'on *devrait* commencer. Prascovie, simple en effet et sans prétentions, n'avait besoin d'aucun effort pour le paraître, et ne se trouvait jamais déplacée dans la bonne société. Un jugement sain, un esprit juste et naturel, suppléaient à son ignorance profonde de toute chose, et souvent ses réponses *inattendues* et fermes déconcertèrent les indiscrets.

(*a*) However, a woman advanced to question her. Prascovia related the terrible night that she spent in the wood; other peasants stopped to listen to her. The starost of the village examined her passport, and pronounced it all right; then the good woman, who was moved, offered her her house; but when the traveller wished to rise, her limbs were so benumbed that she was obliged to be supported. She had lost one of her shoes; she showed her naked foot and swollen legs. She tried, during the visit she was paying there, to make herself useful by sweeping the house, by washing the linen, or by sewing for her hosts.

(*b*) A profound study of the world always induces those who have made it with profit to appear simple and unpretending: so that one sometimes works a long time to arrive at the point where they ought to have started. Prascovia, simple indeed, and unpretending, had need of no effort to appear so, and was never out of place in good society. A sound judgment, just and natural reasoning powers, made up for her profound ignorance of everything, and often her unexpected and firm answers disconcerted inconsiderate people.

2. Parse the words printed in italics. In parsing verbs give their participles.

S'approcha—Reg. intrans. reflexive verb, pret. indic., act, 1st conj., 3rd sing., agrees with '*femme.*'

S'approcher, s'approchant, s'approché.

Attendrie—Past part. of 'attendrir'; 2nd conj., reg. feminine, qual. '*femme.*'

Attendrir, Attendrissant, Attendri.

Voulut—Irreg. trans. (gov. se soulever) verb, pret. indic., act., 3rd sing., agrees with '*voyageuse.*'

Vouloir, voulant, voulu.

Nu—Adj. qual. '*pied.*' Mas. gen. sing., num.

Cousant—Pres. part. of '*Coudre,*' 4th conj., irreg., gov. by '*en.*'

Coudre, Cousant, Cousu.

Ceux—Demonstrative pronoun, 3rd plur., masc., obj., governed by '*ramène.*'

Devrait—Irreg. trans. (gov. commencer) verb, conditional act., 3rd sing., agrees with '*on.*'

Devoir, Devant, Du.

Inattendues—Past part. of '*(in)attendre,*' fem. plural, 4th conj., qual. réponses.

Attendre, Attendant, Attendu.

3. Give the imperfect indicative and the subjunctive present of s'en aller. Translate into French—I want a book. I doubt it. I remember it. What prepositions do penser, remercier, parler, require before a noun?

Imperfect Indicative.

Singular.	*Plural.*
Je m'en allais.	Nous nous en allions.
Tu t'en allais.	Vous vous en alliez.
Il s'en allait.	Ils s'en allaient.

Subjunctive Present.

Singular.	*Plural.*
Je m'en aille.	Nous nous en allions.
Tu t'en ailles.	Vous vous en alliez.
Il s'en aille.	Ils s'en aillent.

3. Il me faut que j'aie un livre.
J'ai besoin d'un livre.
Je veux un livre.
Je désire un livre.
} I want a book.

Je le doute = I doubt it.

Je me le souviens = I remember it.

Verb.	*Preposition.*	*Example.*
*Penser.	à	Pensez à votre mère.
	de.	Que pensez-vous *de* ma maison.
Remercier.	à	Je remercierai cette fille.
Parler.	à	Parlez à l'homme.

*Penser takes à when it means to *reflect* or *think of.*

Penser takes *de* when it means to *have an opinion of.*

4. Write in French:—Alas! replied her father, shedding tears, do you believe, poor child, that one can speak to the Emperor as you speak to your father in Siberia? Sentinels guard on all sides the approaches to his palace, and you will never be able to cross its threshold. A poor girl and a beggar, without suitable dress, without recommendations, how will you venture to appear, and who will condescend to present you?

Hélas, répondit son père, en versant des larmes, crois-tu, pauvre enfant, que l'on puisse parler à l'empereur comme tu parles à ton père en Sibérie?

Des sentinelles gardent de toutes parts les avenues de son, palais, et tu ne pourras jamais en passer le seuil. Pauvre et mendiante, sans habits, sans recommandations, comment oseras-tu paraître, et qui daignera te présenter?

School Management.

WOMEN CANDIDATES.

Thursday, July 7th, 9.45 *to* 12.15.

All Candidates must answer Question 8, and not more than *seven* other questions.

If you answer more than *eight* questions, only the *eight* answers coming first on your paper will be revised.

1. Distinguish between (*a*) *Elementary* subjects, (*b*) *Class* subjects, and (*c*) *Specific* subjects; give a list of them, and show what proportion of time ought to be given in a good school to those groups of subjects respectively.

(*a*) *Elementary Subjects* are Reading, Writing (including Spelling and Composition), and Arithmetic, both ordinary and mental.

We shall suppose that the school is open for secular instruction 22½ hours per week. Then Reading and Recitation should occupy 3½ hours, Writing 3½ hours, Arithmetic 3½ hours.

(*b*) *The Class Subjects* are English, Geography, Elementary Science, History, and (for Girls) Needlework. Not more than two of these can be taken, and the time devoted to them should not exceed 4½ hours per week, except where Needlework is one of the selected, and then another half-hour should be added.

(*c*) *The Specific Subjects* are Algebra, Euclid, Mensuration, Mechanics, Latin, French, German, Botany, Principles of Agriculture, Chemistry, Sound, Light and Heat, Animal Physiology, Magnetism and Electricity, Domestic Economy (Girls), Shorthand, Horticulture, Physics, Navigation, Book-keeping, and Welsh. In some respects Cookery and Laundry Work are accounted '*Specifics*.'

Any other subject may, if sanctioned by the Department, be taken, provided that a graduated scheme for teaching it be submitted to, and approved of, by the Inspector.

No scholar may be presented for examination in more than two 'specifics.'

Not more than four hours per week can be spared for these subjects.

2. (*a*) Explain the best way of arranging a class for a reading lesson; and show how far, in conducting such a lesson, you will make use (*b*) of simultaneous reading, and (*c*) of pattern reading.

(*a*) The best way of arranging a class for a Reading Lesson is along three sides of a square, the teacher occupying the fourth side, and the scholars standing.

Thus all are well within view, the teacher can patrol at the back of the class if need be, and the pupils have not the same opportunity for, or temptation of, indiscipline. Moreover, the class easily divides into three sections, which may be pitted against each other for model simultaneous reading.

(*b*) *Simultaneous* spelling of difficult words should be one of the first exercises, and *simultaneous* reading of the more intricate or elocutionary passages should invariably take place. Thereby not only will the more constant occupation of the children induce better discipline, but a greater amount of practice is secured than individual reading will allow of.

(*c*) *Pattern Reading* should take place immediately after the explanation of difficult words, and should continue at intervals throughout the lesson.

An intelligent pupil as well as the teacher may be selected to pattern for the class. All kinds of provincialisms and indistinct articulation should be rooted out by pattern reading, and the management of the breath, voice, and vocal organs exemplified.

3. (*a*) Name some of the commonest faults of young assistants in teaching *spelling*. (*b*) How much of a spelling exercise should be oral, and how much should be written?

(*a*) (1) Words are syllabified incorrectly with regard to their roots, as *all-en-tion*.

(2) Short words, such as *where* and *were*, do not receive sufficient notice.

(3) Rhyming and alliterative methods are too frequently neglected.

(4) Tests of unseen passages are too frequently set.

(5) Not enough transcription is employed.

(6) Not enough use is made of the manuscript form of a word written on the blackboard. Correct spelling depends to a great extent upon *visual* memory, and the manuscript (not the printed) form of the word is the one to be reproduced.

(7) Mistakes are insufficiently attended to and rectified.

(*b*) Oral spelling from a printed book is of most use in teaching reading, but transcription or oral spelling from blackboard is the better for progress in spelling. For orthographical purposes the lower the class the more transcription is needed; but in the higher standards oral spelling may to some extent take its place.

4. Take the number *Thirty*, and say how many forms of mental exercise you could devise with that number for a class of children in Standard I., so as to give them some early acquaintance with concrete and fractional, as well as simple arithmetic.

(1) How many weeks must a child attend school to be present thirty days?

(2) How many weeks must a child attend school to be present thirty times?

(3) How many pennies, threepences, sixpences are there in half-a-crown?

(4) How many rows of 3, 5, 6, 10 boys could 30 boys compose?

(5) How many times could 3, 5, 6, 10 pennies be taken away from half-a-crown?

(6) What is a third, a fifth, a sixth, a tenth part of thirty?

(7) When 2s. is taken from 30 pennies, what part of a shilling remains?

(8) How many tens, sixes, fives, threes must be added together to make thirty?

(9) What is a third, a fifth, a sixth, a tenth of thirty?

(10) How many yards in 30 feet?

5. Describe a good lesson on *Colour* adapted for an Infant Class, and say what illustrations you would get together before giving such a lesson.

In giving a lesson on colour to infants, their attention should be drawn to coloured objects with which they are most familiar. Their pinafores, frocks, etc., may be noticed, and the colours named—tablets or coloured cards may be placed by the side of these for comparison. Gift I. (Fröbel) is perhaps the best occupation for teaching colours, especially if loose balls are used. Besides these, beads (giving out only the colours to be taught) interest infants very much. The children when handling should say 'That is a *red* bead, that is a *blue* bead, etc.' Having compared with things immediately to hand, the yellow ball may be said to resemble an orange, the blue ball is the colour of the sky, etc. Then a sheet containing the colours may be used for revision. In a more advanced lesson *gelatine tablets* may be used to show how the secondary colours are obtained. In connection with the ball lesson and bead lesson, little songs about the *colours* will give a pleasant ending, *e.g.*,

'The red ball likes to wander,' etc,
The blue ball likes to wander,' etc.

6. (*a*) Make an outline map of the parish or district in which your school is situated; and (*b*) explain how such a map would be useful in giving an elementary lesson on Geography.

(*a*) See ordnance map.

(*b*) It would link 'the known with the unknown,' and by means of the scholars' acquaintance with the neighbouring levels, brooks, hills, woods, etc.; the definitions of plains, rivers, mountains, forests, etc., may be obtained from the children themselves, and will be by them intelligently grasped.

The position of places, the scale of delineation, and the meaning of a map in general may be illustrated.

7. (*a*) In teaching History, say what use, if any, you would make of chronological tables. (*b*) Is it better to learn the date before or after the pupil knows something of an event and becomes interested in it? Give your reasons.

(*a*) Chronological Tables should be used about midway in the ordinary course of study. The Lives of Great Men given in due sequence, descriptions of great events, notable steps in the progress of civilisation (all arranged in temporal order) should certainly precede formal Chronological Tables. Then these latter should be introduced in order to secure precision, and so that the contemporaneousness of events and dates, and their action and reaction upon one another, may be fixed within the comprehension.

(*b*) Whether the date of any particular event should be first learned depends much upon its nature and importance. If it be epoch-making, then the event should first be described and interest aroused; if it be subsidiary, then the date should be learned first.

8. Write out brief notes of a lesson on *one* of these subjects:—

(*a*) Silver.

(*b*) *For Infants:* A blacksmith's forge.

(*c*) The four seasons.

Lessons on *Silver* and *The Four Seasons* can be perused in many books; we therefore insert NOTES OF A LESSON ON 'A BLACKSMITH'S FORGE.'

Time, 30 minutes; *Apparatus*, blackboard picture of forge, models of anvil, sledge-hammer, bellows, etc., clay, a piece of iron, and a candle.

I. *Introduction* based upon

'Children coming home from school
Look in at the open door;
For they love to see the flaming forge,
And hear the bellows roar,
And catch the burning sparks that fly
Like chaff from a thrashing floor.'

II. Clay can be moulded. Can iron? If not, why not? How can we make iron pliable? By heating it, red-hot or white-hot. Iron will not melt, will not even get white hot in an ordinary fire. How can we make a very hot fire? By a draught, just as sometimes a smouldering candle may be blown in again. How can we get this draught? By forcing the air through the fire by means of bellows, just in the same way that mother sometimes does at home.

III. Now show the bellows, and models of implements, together with pictures and blackboard sketches. Explain the use of the anvil, why it is made of iron, the use of the sledge-hammer. If an actual sledge-hammer can be procured let children try and lift it. A blacksmith's arms become very strong.

IV. At a forge horses are shod, pokers, hooks, brackets, etc., are made, fashioned or sharpened.

9. (*a*) In using a map, show how you would give a true idea of the size of the country, and of the distances between important places. What use should be made, for this purpose, of the lines of latitude and longitude, and of the scale of miles? (*b*) Say, approximately, what is the distance from London, of—York, Exeter, Bedford, Norwich, and Edinburgh.

(*a*) The size of a country may be shown by comparison with other countries drawn to the same scale, by actual measurement with the given scale of miles, and by calculations drawn from the lines of latitude and longitude.

As the meridians are all great circles every degree of latitude is of equal length, viz. $\frac{25020}{360}$ miles, or 69½ miles nearly. The difference in latitude between two places on the same meridian will therefore readily give their actual distance in miles. But with degrees of longitude it is far different, for the parallels are, with the exception of the equator, not great circles, and vary from 0 miles in circumference at the poles, to 25,000 miles at the equator. It is therefore requisite to know the length of the given parallel before we can calculate distances by means of differences of longitude.

(*b*) The distance from London to (1) York is approximately 175 miles; (2) Exeter, 160; (3) Bedford, 48; (4) Norwich, 98; (5) Edinburgh, 332 miles.

10. Name any poems or verses which you would choose to be learned by heart, *either* (*a*) by infants, or (*b*) by scholars in the Sixth Standard; and (*c*) say what is the use of memory exercises of this kind.

(*a*) 'Poor Joe.'
'The Clucking Hen.'
'Two Little Mice.'
'The Blackbirds.'

(*b*) Quarrel Scene between Brutus and Cassius.
'The Charge of the Light Brigade.'
'The Ancient Mariner.'
'Macaulay's Armada.'

Memory exercises of this kind should never be used to any great extent in imparting information. Their object should be to secure distinctness of utterance, to train the elocutionary powers, to assist presence of mind and banish shame-facedness, to arouse sentiments of courage, endurance, patriotism, filial affection and kindness to animals, to stimulate the imagination, and to cultivate a love of art, by means of rhyme, rhythm, and the perfection of literary form.

11. What are the best expedients you know for reviving the attention of a languid or disorderly class?

Changes in occupation, variations of posture, removal to another class place, a break in the lesson employed in bodily exercises, the substitution of a different teaching method, such as questioning instead of lecturing, a pleasant or jocose remark, gentle satire (*not scolding*), and the utilisation of emulation will all at different times be found serviceable, in arousing the attention or subduing disorder. Constant and pleasant, yet differentiated, employment should be effective in preventing (which is better than curing) languor and disorder.

12. Describe the method you adopt in teaching 'singing by note' to a class of beginners.

The Tonic Sol-fa method is to be recommended, and should be taught vocally, and not instrumentally. The characteristics of Doh, Me, Soh should be explained, and the relation of the latter two, to the tonic, be impressed.

A modulator with only these three notes upon it, arranged in proper vertical order should be used, ME being frequently patterned as the restful note, and SOH as the bright, trumpet-like note. 'Bottom' ME and SOH must not be at present sung.

SOH, TE, RAY come next in teaching order, TE being a leading and leaning note, which if dwelt upon will require, as a sequence, D^1; and RAY an aspiring note. These notes will the more readily be grasped, because, taken by themselves, they are exactly the same as the series DOH, ME, SOH, except for a difference of pitch.

FAH should next be described and patterned as the dull, sturdy, bull-roaring note, whilst LAH is the mournful, drooping, awe-inspiring tone. FAH, LAH, DOH^1 must now be attacked. These also represent DOH, ME, SOH, with a difference of pitch.

Now the scholars will be ready to run up and down the entire scale, with frequent recapitulation of the exercises already given, and their introduction in descending order.

13. Say what is the use, to a pupil teacher, of keeping a diary of employments, or notes of the lessons he or she gives. If you have been accustomed to preserve such a record, describe it.

The answer to this question depends in great measure upon the scope given to the meaning of the word '*employment*.' We judge that it does *not* include the pupil teacher's occupation with his own studies, but that it refers merely to his duties as a teacher, and not as a pupil.

In this latter and restricted sense the diary of a pupil teacher will coincide in general with the authorised routine of the school, but in particulars will transcend it, and will give details of the schemes and syllabuses of the various subjects, together with an account of the special difficulties encountered, the backwardness of individual scholars, and the salient points to be dwelt upon.

It is well—nay, even requisite, to preserve 'Notes of Lessons,' with observations added as regards the effect of the lessons; for thereby, by failure or success, points that need strengthening, or methods that should be adopted, are recorded.

A pupil teacher's diary should take note of all the preceding items, and should also contain the results of examinations, lists of backward scholars, and an account of any details that need especial elaboration.

14. What sort of decoration is most appropriate in a schoolroom, and most likely to make it bright and attractive to the scholars?

The colour of the walls of a schoolroom should be of a bluish-green, and a few instructive mottoes might be painted around the room on the highest portion of the walls. *On* the walls should be hung maps, historical pictures, natural history scenes, etc.; *to* the walls should be affixed busts of eminent men, drawing casts, and specimens of manufacturing processes, and *against* the walls should be arranged cabinets of specimens useful for object lessons, and illustrative of the articles used in every-day life.

Where space permits, there should be an ornamental record on the wall of the achievements of past or present scholars who have distinguished themselves.

Geography and History.

FEMALE CANDIDATES.

Thursday, July 7th, 2 to 5.

GEOGRAPHY.

Answer the first question and four other questions. If you answer more than *five* questions, only the five answers coming first on your paper will be revised.

1. Draw an outline map with lines of latitude and longitude of
(*a*) The English Channel; OR
(*b*) The Basin of the Mississippi; OR
(*c*) Africa south of 20° South Latitude.
See any good atlas.

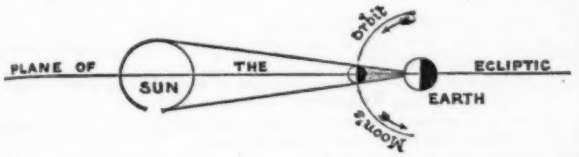
2. (*a*) State the relative positions of the sun, the moon, and the earth during an eclipse of the sun and during an eclipse of the moon.

(*b*) Why is there not an eclipse whenever there is full moon or new moon?

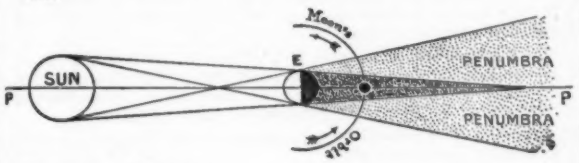
(*c*) What is the latitude (*a*) of a place which is 10° distant from the North Pole; (*b*) and of a place which is 100° distant from the North Pole?

(*d*) What is the longitude of a place where it is 6 a.m. at the same time that it is mid-day at Greenwich?

(*a*) An eclipse of the sun is caused by the moon interposing itself between the sun and the earth, and the three bodies are in a straight line.



An eclipse of the moon is caused by the earth interposing itself between the sun and the moon, and the three bodies are in a straight line.



PP = Plane of Ecliptic.

(*b*) It will be seen from the preceding answer that if the plane of the moon's orbit coincided with the ecliptic there would be an eclipse of the sun at every new moon, and an eclipse of the moon at every full moon; but the plane of the moon's orbit is inclined to the ecliptic at an angle of 5°, and hence it is only when new or full moon occurs at or near the nodes (the points where the moon's orbit and the ecliptic intersect) that an eclipse occurs

(*c*) *a*. 80° N. Lat. *b*. 10° S. Lat.

(*d*) It takes 24 hours for all the meridians, or 360°, to present themselves to the sun, and hence in 6 hours the sun crosses $\frac{1}{4}$° = 90°. As the time at the given place is earlier than Greenwich, mid-day will be later there; and therefore it is West of Greenwich.

∴ Long. = 90° W. Long.

3. (*a*) Give a description of and explain the importance of two of these: Gibraltar, Aden, Hong Kong.

(*b*) Name four large cities, not in Europe, in which the Spanish language is mainly spoken. Describe the position of, and say what you know of the political state of one of them.

(*a*) The peninsula of *Gibraltar* is a strong natural fortress composed of grey limestone. It is three miles in length, from W. to S., and three-quarters of a mile broad, and is connected with the mainland by a low, sandy isthmus. The rock attains its greatest elevation at a height of nearly 1,440 feet, and is inaccessible on the north and east, and nearly so on the south.

On the west it slopes down to Gibraltar Bay on which stands the town of Gibraltar, and is rendered further impregnable by the presence of formidable batteries. The fortress is of great political importance, as it commands the entrance to the Mediterranean Sea, which at this point is only thirteen miles wide. The total population exceeds 25,000, of whom 7,000 are soldiers.

Aden is a small rocky peninsula of volcanic origin, situated near the S.W. corner of Arabia, and 120 miles from the entrance to the Red Sea. In some places it attains an altitude of 2,000 feet.

The town of Aden on the east side is built in the crater of an extinct volcano. The climate is hot, but is generally considered healthy. It is the keystone to the entrance to the Red Sea, is a place of much strength, well garrisoned, and is of great importance as a coaling-station for ships passing to and from India. It is twenty square miles in area, and has a population of 30,000.

Hong Kong is a small island at the mouth of the Canton River. It has an area of thirty square miles, and a population of 124,000. On the west side of the island is situated the beautiful town of Victoria, surrounded by hills 2,000 to 3,000 feet in height. It is of great importance both as a military and naval station, and is the centre of our trade with China in opium, betel nuts, sandalwood, rice, tea, silk, and manufactured goods.

(*b*) Rio Janeiro, Monte Video, Buenos Ayres, Valparaiso.

Rio Janeiro, the capital of Brazil, is the most important city in South America. It stands on the western side of a magnificent and almost landlocked harbour surrounded by splendid scenery. The entrance to the harbour is defended by Island Fort, a singular hill, in the form of a sugar-loaf. The commerce of Rio is extensive, the chief export being coffee. The town is now the centre of a Republican government, the late emperor having been dethroned by a revolution in 1889.

4. Give a summary of what you know about London under these heads—(1) position; (2) approximate area and population; (3) supply of food and fuel; (4) commercial and financial importance; (5) access to seaside watering-places.

London is situated on both banks of the River Thames, about 45 miles from its mouth. It occupies a relatively central position amongst European capitals, and is the centre of the land hemisphere. Its area within the Parliamentary boundaries is about 72 square miles, and its population is approximately 5,000,000.

The food supply of London is drawn from all parts of the globe. Corn from Russia, meat from Canada and Australia, and vegetables from the vast suburban market-gardens that surround it. A visit to the immense markets of Leadenhall (Poultry), Billingsgate (Fish), Covent Garden (Fruit and Flowers), Smithfield (Cattle) will give one some idea of the vast supply of food consumed by this great city. The supply of fuel is largely drawn from the Newcastle coalfields. In commercial and financial importance it ranks second to none.

Its various lines of railway insure rapid transit to and from the various seaside resorts. By the London, Chatham, and Dover, the London, Brighton and South Coast and the South-Western Railways, one is enabled to reach any watering-place on the south coast in a few hours; whilst the Great Eastern, North-Western, Great Northern, and Great Western render such places as Harwich, Yarmouth, Whitby, Bath or Llandudno within a few hours' journey.

(5) Give a summary of what you know about India under these heads—(1) approximate size; (2) climate, with special reference to rainfall in different parts; (3) mountains.

India comprises an area of 1,378,044 square miles, and it lies between 8° and 37° N. lat., the larger portion of it is within the tropics. The temperature is influenced considerably by the surface elevation, and in the southern parts the close proximity of the ocean modifies the excesses of heat. The rains of India are largely controlled by the monsoons, which occur with much regularity, the south-west monsoon bringing abundant rain to the Malabar coast, and the north-east monsoon bringing some rain to the Coromandel coast. The average rainfall is not much in excess of that in England, but in some districts excessive rainfall occurs, whilst in others comparative drought exists.

At Mahableshwar the annual fall exceeds 300 inches, and at Cherra Poongee it is double that quantity.

The parched districts comprise certain districts along the Coromandel coast, the Great Indian Desert, and the Deccan.

Commencing on the north, we have the vast system of the Himalayas, stretching in a curve from north-west to south-east for a distance of 1,500 miles, which contain the highest mountain in the world, Mount Everest, 29,000 ft. South of the Great Plain of Hindostan are Aravulli and Vindhya Ranges, with an average elevation of 2,000 feet.

The plateau of the Deccan is bounded by the Eastern and Western Ghauts. These ranges unite in the south, and form a mountain group named the Neilgherry Hills.

The Western Ghauts, which attain a height of 6,000 feet, continue almost without a break to Cape Comorin. The Eastern Ghauts are of less elevation, and are more broken in their course. The Suleiman and Hala Mountains form part of the western boundary of Hindostan, and stretch from Khyber Pass almost to Kurrachee.

6. What information would you give in a lesson on

(*a*) The mountains and plains of Europe; OR
(*b*) The lakes and rivers of British North America?

(*a*) Two-thirds of the surface of Europe are comprised in the Great Plain which extends from the Atlantic to the Ural Mountains. In the eastern portion it reaches from the White to the Black Seas, but gradually narrows as it approaches the west coast.

The mountains of Europe may be assorted into nine groups: the Alps, Balkans, Carpathians, mountains of Germany, France, Spain, and Scandinavia; the Urals and the Caucasus Mountains.

The Alps extend in a curve round the north of Italy from the Gulf of Genoa to 15 E. long.

They are known under various names in various portions of their circuit, *i.e.*, Maritime, Cottian, Graian, etc., and contain many important peaks, such as Mont Blanc (15,760 feet), St. Gothard, Rosa, Matterhorn, etc.

A great portion of this system exceeds the altitude of 9,000 feet. The Appenines and the Jura Mountains may be regarded as branches of the Alpine system. The Balkans stretch across Turkey from the Alps to Cape Emineh on the Black Sea, but only attain the average elevation of 3,050 feet.

The mountains of Germany include the Riesen-gebirge and Erz-gebirge Mountains, as well as the Harz Mountains and the Black Forest. The mountains of France comprise, beside the border Alpine ranges, the Cevennes and Auvergne Mountains. The mountains of Spain include the Pyrenees and several other chains running parallel to them. The Scandinavian Mountains form, as it were, the backbone of the peninsula, and extend from Cape Nordkyn to the Naze. The Ural Mountains, which average 3,000 feet in height, stretch southward from the Arctic Ocean for 1,250 miles, and form part of the eastern boundary of the continent. The Caucasus Mountains reach from the Caspian to the Black Seas, and contain the highest mountain in Europe, Mount Elburz, 18,500 feet.

(*b*) The lakes of British America are very numerous, and, as they are generally connected with rivers equally as numerous, form a vast and intricate water communication extending from the shores of the Atlantic to the Pacific Oceans. The four principal rivers are the St. Lawrence, Mackenzie, Saskatchewan, and the Fraser.

The St. Lawrence rises in Lake Superior, the largest freshwater lake on the globe, and flows under the name of St. Mary into Lake Huron. This lake is divided by the Manitoulin Islands and a peninsula into two portions. From the southern extremity of this lake flows River St. Clare, which, after expanding into Lake St. Clare, is drained by the Detroit, which flows into Lake Erie. Lakes Erie and Ontario are connected by the Niagara River, famed for the celebrated falls. The St. Lawrence issues from Lake Ontario under this name, and after flowing past Montreal and Quebec expands into the Gulf of St. Lawrence, after a course of 2,000 miles. Its chief tributaries are the Ottawa, Richelieu, St. Maurice, and Saguenay.

The Mackenzie rises near Mount Brown under the name of Athabasca, and flows into Lake Athabasca. It flows from thence to Gt. Slave Lake under the name of Slave River, and issuing from thence is known as the Mackenzie river. It receives the waters of Turnagain River and a drainer of Bear Lake, and after a course of 2,000 miles empties itself by a delta into the Arctic Ocean.

The Saskatchewan is composed of two branches which have their source in the Rocky Mountains, and after a course of 340 miles enters Lake Winnipeg. The surplus waters of Lake Winnipeg are discharged by the Nelson River into Hudson Bay.

The Fraser rises near Mount Brown, and at first flows north-west; then turning suddenly to the south-west is joined at Fort George by River Stuart. It then flows southward and receives many feeders, the principal of which is the Thompson. It then flows through a gorge in the cascade range, and after a course through a fertile wooded district, discharges its waters by means of a delta, at the head of which stands New Westminster, into the Pacific Ocean. The total length of the river is 800 miles.

7. Answer two of (*a*), (*b*), (*c*).

What do you know about the origin of the names in (*a*), (*b*), (*c*)?

(*a*) Chester, Edinburgh, Philadelphia, Washington, St. Petersburg.

(*b*) England, France, Normandy, Austria, Lombardy.

(*c*) The Kingdom of Italy, the Kingdom of Greece, the German Empire, the United States, the Great Mogul, the Empress of India.

(*a*) *Chester* (from Latin castra = military camps) owes its name to the Roman occupation of Britain, when a Roman garrison was stationed there.

Edinburgh, originally spelt Eadwinesburgh = Edwin's Town, was founded by Edwin of Deira in the early part of the seventh century, who built its noted castle to protect his northern frontier.

Philadelphia (from φιλος = love, and αδελφος = brother) means the city of brotherly love, so named from the amicable constitution of its founders the Pilgrim Fathers.

Washington, so named in honour of the hero Washington, who so victoriously led the American forces in their struggle for independence.

St. Petersburg, named after its founder, Peter the Great.

(*b*) *England*, originally Englaland; named after the Angles or Engle, the most powerful of the German races who invaded England in the fifth century, and became the progenitors of the English race.

France, named after the Franks who conquered France, then called Gaul, in the fifth century.

Normandy, named after the Normans or Norsemen, as they were called, who invaded France under the command of Rollo, and wrested Neustria from Charles the Simple.

Austria, probably from German Oesterreich (= Eastern Empire) and French Autriche.

Lombardy takes its name from its inhabitants the Longobardi. Some derive the latter term from the long bards or spears by which the nation is said to have been distinguished; others from the long strips of land (barde) which they originally inhabited on both sides of the Elbe.

(*c*) *Kingdom of Italy.*—The Italian Commonwealths (Pisa, Lucca, etc.) in 1531 were placed under the power of the Emperor, who became King of Italy.

Kingdom of Greece.—After the battle of Navarino in 1827 it was decided by England, France, and Russia that Greece should be a separate kingdom, and the crown was eventually conferred on Prince Otho, a younger son of the King of Bavaria.

German Empire.—In 1871 the confederations of 1866 were abolished, and all the German states, except Austria, were combined in a new German Empire, under the hereditary supremacy of Prussia.

United States.—At the conclusion of the War of Independence in 1783 thirteen states were recognised as forming the union under the name of '*United States*.'

Great Mogul.—The Moguls, Moghuls, or Monguls were a race of men inhabiting the northern steppes of Asia. They infested Hindostan from 1215, and in 1526, under their leader, Baber, founded the *Great Mogul* Empire of India, which Akbar consolidated.

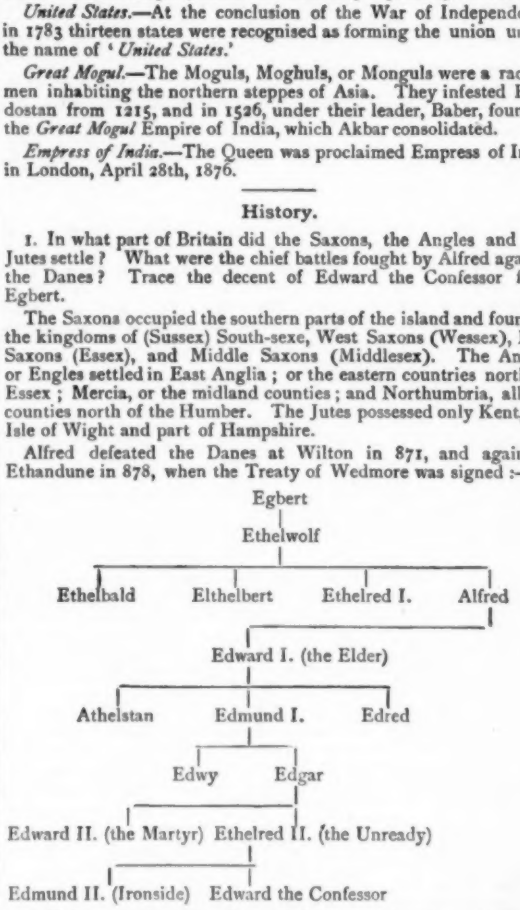
Empress of India.—The Queen was proclaimed Empress of India in London, April 28th, 1876.

History.

1. In what part of Britain did the Saxons, the Angles and the Jutes settle? What were the chief battles fought by Alfred against the Danes? Trace the decent of Edward the Confessor from Egbert.

The Saxons occupied the southern parts of the island and founded the kingdoms of (Sussex) South-sexe, West Saxons (Wessex), East Saxons (Essex), and Middle Saxons (Middlesex). The Angles or Engles settled in East Anglia; or the eastern countries north of Essex; Mercia, or the midland counties; and Northumbria, all the counties north of the Humber. The Jutes possessed only Kent, the Isle of Wight and part of Hampshire.

Alfred defeated the Danes at Wilton in 871, and again at Ethandune in 878, when the Treaty of Wedmore was signed:—



2. Point out how Anselm and Langton played an important part in English History.

Anselm was Abbot of Bec during the schism of Urban and Clement. He championed the cause of Urban and attempted to introduce his authority into England and so enraged King Rufus who summoned a synod to depose Anselm. Thus began that war between Church and State that was maintained for ages. Anselm, after sending his quota of soldiers demanded by the king, with miserable accoutrements, and demanding restitution of his revenues, found his position so critical that he obtained permission to cross the sea. He was afterwards recalled by Henry I., who knowing Anselm's great authority reinstated him as Archbishop.

Anselm refused to do homage, and caused Henry to resign the right of granting investitures. He, after an important yet troubled life, died in 1109.

Stephen Langton was born in the year Previous to being created Archbishop of Canterbury in 1205, he was Chancellor of the University of Paris.

The King appointed the Bishop of Norwich; and the Sub-Prior of Canterbury was elected by the monks; but on appealing to the Pope, he rejected both, and appointed Langton. He it was that released King John from the dreaded Papal Interdict, and effected his restoration to the throne. He was the great champion of the rights of the people, and refused to excommunicate the barons who leagued against John. It was mainly due to the efforts of this bold prelate that the famous Magna Charta, insuring liberty and justice to the people, was wrung from the reluctant John, and up to his death, in 1228, he remained a firm supporter of national liberty.

3. Give (with dates) the chief events in the reign of Henry VII.

1486. Rival houses of York and Lancaster united by marriage of Henry VII. with Elizabeth of York. The Star Chamber Court revived.

1487. Lambert Simnel proclaimed as Edward VI.; and afterwards defeated at Stoke, near Newark.

1492. Perkin Warbeck, a second impostor, appeared. America discovered by Columbus.

1496. James VI. of Scotland invaded England in favour of Warbeck.

1497. Insurrection in Cornwall against taxes.

1499. Perkin Warbeck and Earl of Warwick executed for high treason.

1501. Arthur, eldest son of Henry VII., married to Catherine of Arragon.

1503. James IV. of Scotland married Margaret, daughter of the King.

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4. What do you know about the relations between the Sovereign and Parliament in the reign of Henry VIII., and between 1600-1630? Mention Acts of Parliament or historical incidents which show what were the matters in dispute.

Henry's first Parliament, as well as the Parliament of 1513, were remarkably subservient to his will, and readily granted the supplies he demanded. The Parliament of 1521 were not quite so servile, and merely granted a modicum of his requirements. His subsequent Parliaments are noted for their subordinate demeanour. They conferred on Henry the title of Supreme Head of the Church, and aided him in suppressing the monasteries and replenishing his own coffers. Henry acted as a despot, executing his wives when he thought proper, changed the religion, spent the nation's money, and even appointed the rulers of the nation during his son's minority with as little opposition as there would have been had no Parliament existed.

Elizabeth, like all Tudor sovereigns, treated her Parliaments very haughtily, but the Commons took care to assert their privileges whenever a favourable opportunity arose. In 1601 they steadily opposed the monopolies she had granted during her reign, but Elizabeth maintained her prerogative to the end.

During James's reign we observe the beginning of that struggle between the King and the Parliament which ended in the overthrow of absolute monarchy.

James would have dispensed with Parliaments, but for the necessity of supplies, and they soon began to act on the principle: No supplies until grievances are redressed.

James's first Parliament remonstrated with him about his illegal taxation, and when they refused him supplies, he sent four of the leading members to prison.

The Parliament of 1621 attacked monopolies at once, and straightway impeached Sir Giles Mompesson; they next attacked the corruption of Justice, and Francis Bacon fell a victim to their zeal.

This Parliament afterwards recorded a celebrated protest when directed not to interfere with Prince Charles's marriage. Charles I. came to the throne in 1625, and the struggle was still maintained.

In 1628 the famous Petition of Right was drawn up, and an assent wrung from the King, and thus the breach became wider and wider, and finally ended in the execution of Charles and the establishment of a constitutional monarchy.

5. What were the chief causes of enmity between England and Spain in the time of Elizabeth? between England and France in the time of William III.?

Almost as soon as Elizabeth had ascended the throne, Philip of Spain made an offer of marriage which she summarily rejected. She proceeded to change the religion for the Protestant creed, and as Spain was then the champion of the Pope, this naturally estranged England and Spain. Again, when the Netherlanders revolted, Elizabeth aided them with money and troops, though she refused to govern them, and retaliated by persecuting the Catholics in England. In 1570 she was formally excommunicated by the Pope, who, through the aid of Spain, endeavoured to place Mary Queen of Scots upon the English throne. All this, together with the daring piratical attacks of the English seamen upon Spanish vessels and Spanish ports, made bitter enmity between the two nations. The climax was reached when Elizabeth executed Mary Queen of Scots, which caused Philip to prepare that famous Armada which was never destined to fulfil the great project for which he intended it.

Louis the King of France was the most powerful Catholic sovereign in Europe. William had long been regarded as the head of the Protestant cause, and so Louis gladly availed himself of the chance for a war which the dethronement of James presented to him. Thus the chief cause of enmity was on the score of religion, though the superficial reason of aiding James to obtain his 'rights,' as he termed them, was urged as an excuse for his hostile measures.

6. Give dates, or approximate dates, of

Landing of the Pilgrim Fathers, 1620.
Founding of Pennsylvania, 1682.
Defeat of the Armada, 1588.
Capture of Gibraltar, 1704.
Capture of Quebec, 1759.
Battle of Plassy, 1757.
Battle of Blenheim, 1704.
Founding of East India Company, 1600.
Abolition of East India Company, 1858,
Passing of the Navigation Acts, 1651.
Repeal of the Navigation Acts (partially) in 1849.

7. What do you know of Margaret, the Maid of Norway; the battle of Pinkie; the Rye House Plot?

Margaret, commonly called the Maid of Norway, was the daughter of Eric, King of Norway, and of Margaret, daughter of the Scottish monarch. On the decease of Alexander III. she was recognised as successor to the crown. Edward I., King of England, attempted, by the marriage of his eldest son with Margaret, to unite the whole island into one monarchy. Unhappily, this amicable project, so happily formed, was frustrated by the death of the princess, who expired whilst on her voyage to Scotland (1291), thus leaving the kingdom destitute of any recognised heir to the throne.

Battle of Pinkie. Soon after the death of Henry VIII., the Protector, the Duke of Somerset, determined to execute the late king's project of uniting the kingdoms of Scotland and England by marriage.

He levied an army of 18,000 men, and provided with a fleet of sixty ships, invaded Scotland, and defeated the Scots in a well-contested battle at Pinkie, near Musselborough (September 10, 1547). Instead of pursuing his victory he became impatient to return to England. Soon after his return, the infant queen was conveyed to France and betrothed to the Dauphin, and thus the victory was fruitless.

The champions of liberty despaired of gaining privileges from Charles II., but expected no better results from his destined successor, James II.

Therefore, in 1683, a conspiracy was started to change the succession at Charles's death, by placing Monmouth on the throne. William Lord Russell, and Algernon Sidney were the prime movers and spread the plot far and wide. A set of middle-class persons, without the knowledge of Russell or Monmouth, formed a plot to murder the king whilst on his return journey from the Newmarket races. Their plan was to cause an obstruction by overturning a cart, and then to shoot the king during the delay caused by the stoppage. All this soon leaked out, and the two plots were treated as of one origin. The king executed Russell and Sidney, but Monmouth effected his escape to the Continent.

Needlework.

Friday, July 8th, 2 to 4.

Cut out and tack together the paper pattern (half-size) of an infant's nightgown.

Make up, in calico, the sleeve (full size) of an infant's nightgown. Mark in cross-stitch the initials V.R.

Marks will be given for industry and finish.

(To be continued.)

PUBLICATIONS REVIEWED.

The Literature of France. By H. G. Keene, Hon. M.A., Oxon. London: John Murray.

The growing success of the University Extension Movement has given occasion for the publication of more than one series of manuals, whose avowed aim is the guidance of University Extension students in their special lines of study. One such series bears the imprint of the House of Murray, and one volume of this series is now before us. Its subject is French Literature 'from the beginning of the nation to a time immediately preceding our own'; and if the other volumes of the series are as well done as this, their success, we imagine, would be assured, and the students who take them as guides might well be congratulated on their good fortune.

Mr. Keene proves his fitness for the task he has undertaken, not only by the thorough mastery of his subject he everywhere displays, but also by the agreeable manner in which he makes his stores of knowledge available for his readers. He seems especially qualified to give the kind of guidance University Extension students should need and seek. His familiarity with the details of the subject enable us to depend upon him for facts, and his breadth of view inspires us with confidence in the general conclusions he leads us to deduce from the facts.

In the Introduction the author discusses several general questions—such as 'Is Literature for the many or the few? Are we chiefly to study the Idealists or the Realists? Is there an absolute standard in the Art of Literature?' From this discussion he deduces principles that lead up to the statement that 'the history of a nation's literature will be seen to be the history of the nation's intellectual evolution.' With this for a basis he divides the history of French Literature into five periods—the Age of Infancy, the Age of Adolescence, the Age of Glory, the Age of Reason, the Age of Nature. The Age of Glory is that of the great French dramatists, Corneille, Molière, and Racine. The Age of Reason is that which led up to the French Revolution, and the Age of Nature is that which succeeded it. Mr. Keene fully discusses the influence which literature had in helping to bring about the Revolution, and the effect which the Revolution, in its turn, had upon Literature. Two concluding chapters are devoted to an inquiry into the sources of Modern French Literary Art, and Modern Prose Fiction. The former of these contains interesting analyses and criticisms of several masterpieces, especially of Racine's *Athalie*, which is spoken of as the dramatist's last and 'greatest work,' and Voltaire's *Zatre*. The last chapter brings us back to the question of Romance and Realism, and we cannot doubt that Mr. Keene's sympathies are not with the modern realistic school of writers.

The whole of the work abounds in masterly criticism well supported by references and extracts which will be greatly relished by the reader. The author admits his indebtedness to Demogeot, Le Franc, and other modern French writers on the subject; as also to Mr. George Saintsbury, whose Short History of French Literature is subjected to some discriminative criticism in an appendix.

A brief notice like this cannot do full justice to the merits of Mr. Keene's Manual; but we hope it may lead some of our readers to become better acquainted with it.

A Primer of English Etymology. By the Rev. W. W. Skeat, Litt. D., LL.D., M.A. Oxford: Clarendon Press.

The name of the author is a sufficient guarantee for the excellence of this book; and the contents fully justify expectation. It should be in the hands of everyone who desires to form an opinion upon the 'Reform of English Spelling,' or who wishes to begin Anglo-Saxon, or who desires to take a London Degree. The method adopted throughout is consistently historical, and the fallacies and pitfalls of bare theory are frequently exposed. 'The shortest description of modern spelling' is well worth quoting verbatim. 'It represents a Victorian pronunciation of *popular* words by means of symbols imperfectly adapted to an Elizabethan pronunciation. The symbols themselves are mainly due to the Anglo-French scribes of the Plantagenet period, whose system was meant to be phonetic. It also aims at suggesting to the eye the original forms of *learned* words. It is thus governed by two conflicting principles, neither of which, even in its own domain, is consistently carried out.' Great and deserved insistence is manifested in the way in which Professor Skeat lays down that the sounds of the words at different periods are of much greater importance than their literary forms. To demonstrate this, the history of the Anglo-Saxon *ā* is traced in the typical word *stan*, now stone, and an instructive chapter on the 'Development of vowel-sounds in English' follows. Such laws as Grimm's and Verner's are lucidly explained, and in the comparatively small compass of 112 pp., a wonderful amount of clearly imparted instruction, of sequentially introduced principles, and of mental training, is fascinatingly given. It were superfluous to wish the book success.

Chambers's Spelling Teacher and Manual of Dictation Tests. London and Edinburgh: W. and R. Chambers, Limited.

Chambers's Spelling Manual. Same publishers.

The spelling of English words is so full of anomalies and difficulties that to secure anything like general accuracy the teacher and pupil alike need all the aids that can possibly be devised. The compiler of the Spelling Teacher recognises the difficulty of the subject, but why plunge so recklessly *in medias res* as he does by giving on the first page a list of monosyllables with the long sound of a represented in eight different ways? The phonetic arrangement which brings together all the various ways of representing each sound seems to us likely to increase rather than to resolve confusion. It would be much better if the earlier lessons were based on resemblances of form corresponding to resemblances of sound, and if the anomalies were introduced by degrees. This principle, it should be said, is very fully illustrated in the forty or fifty pages which form Section IV. of the book, and to a considerable extent in the lists of difficult words collected in Section V., but it would have been well to adopt it in Section I.

The second section includes the rules it is usual to give in spelling books, with lists of examples and exceptions; and the sixth section is a well-chosen assortment of dictation tests gathered 'from the best authors and magazines,' and graduated for Standards IV. to VII. In the earlier parts of the books abundant illustrative sentences are given as dictation tests, and these are likely to be very helpful to the teacher.

The Spelling Manual consists of the lists of words without the dictation tests, and is intended to be used by the pupil in preparing spelling lessons.

Physiography, by the late Dr. Findlater. New Edition by Dr. David Forsyth. London and Edinburgh, W. and R. Chambers, Ld.

Most teachers know that, as a cheap and reliable book on Elementary Physiography, there are few, at the present time, which excel the one before us; and Dr. Forsyth seems to have done his best to bring the manual up to date. In the preface we read that 'the text-book is based on the requirements of the syllabus of the Science and Art Department.' It may be well, therefore, to see how these requirements are fulfilled. From the fact that the subjects of many recent questions in Physiography have not been considered in any text-books designed to cover the Departmental syllabus, it is evident that the authors of the text-books and the examiners have very different ideas as to the meaning of many of the heads. A couple of years ago, examinees in Elementary Physiography were asked to describe 'an achromatic, astronomical telescope.' The few who attempted this question were said to have done their work shockingly. On one paper the instrument was described as consisting of 'a piece of glass and two pieces of wood,' and on another the examiner was solemnly informed that disastrous consequences might

follow upon the reckless use of an astronomical telescope, for 'the lenses turned things upside down,' the budding genius thus furnishing another proof that 'a little knowledge is a dangerous thing.' At the time about which we write there was a great outcry against the question mentioned; and to an ordinary observer the examiners would appear to have committed an injustice in setting it. But when the matter was discussed it was pointed out that one of the heads of the syllabus reads 'methods of measuring angular space and time.' To measure time, a transit instrument is needed, and a transit instrument is an achromatic, astronomical telescope. So, by this somewhat far-fetched argument, the right of the examiners to worry the candidates with the offending question was vindicated. Such instances might be considerably multiplied, but it is unnecessary to extend them here. The point we wish to bring out is, that Dr. Forsyth, being mortal, differs from the examiners in his interpretation of the extent of information required under different heads of the syllabus. He describes a theodolite, but does not state the optical principles underlying its construction. His account of Foucault's pendulum is not nearly full enough to obtain a pass under the present rules, and had the three astronomical questions set in May, 1891, been answered word for word as they are printed in this book, they would only have obtained about half marks. With regard to portions of the book dealing with subjects other than astronomical. It is not exactly correct to define stress as 'the pressure that produces change of form.' There is a stress existing between the earth and the sun—the gravitational stress; we have also the cohesive stress, and others to which the definition given cannot be applied. For the proper meaning of stress, Dr. Forsyth had better look up Clerk Maxwell's 'Matter and Motion.' In 1889, one of the examination questions was 'How can the weight of air be determined?' The correct method is, of course, to weigh a flask of known capacity exhausted and filled with air, but no mention is made of this experiment. Lack of space will only permit us to say a few words more. The book is as good, if not better, than most of those written up to the syllabus of Science-and-Art-Department-Physiography. It is an easy introduction to the study of nature, but not a book to be recommended to those who seek to pass the Physiography examination. The matter is not treated so fully as it should be; for let it be remembered that the knowledge required to obtain a first class certificate when Dr. Findlater first put together the book before us, is no longer sufficient for this distinction. Science keeps moving on. Examiners put on the screw, and rightly. So let all who are concerned remember that Physical Geography is not synonymous with Physiography; and, furthermore, let them bear in mind that a work which devotes a dozen pages or so to a description of the earth as a part of the universe, as this one does, is not calculated to give them the knowledge which will command success.

Medburn Nursery Rhymes. By F. W. Farrington. London: J. Curwen & Sons.

The design of this little book is stated in the preface. Twenty-five 'Rhymes were selected and set to music primarily with the object of providing suitable material for *Tableaux Vivants* within the grasp of juvenile performers.' The object has been fully attained; the music is simple and pleasing, and the selection of rhymes highly suitable for stage effect. A large part of an effective programme for a school entertainment could be got out of the book.

The 'Manley' Arithmetic. By A. Jordan. Manchester: J. B. Ledsham.

This arithmetic is published in four booklets at a penny for Standards II. to V. and one at twopence for Standards VI. and VII. It contains a large number of mechanical examples with various problems and tests at invervals. In the last book the rules for the various kinds of sums are given in the shape of formulæ, and worked examples are prefixed to many of the exercises. A few clock sums and some special examples distinguish it from other books of the same kind.

A First Book of Mechanics for Young Beginners. By Rev. J. C. Easton, M.A. London: Cassell and Co., Ld.

This work is a text-book on mechanics, treated with mathematical strictness, and suitable for beginners whose mathematical knowledge is limited to Euclid's Geometry and to Algebra as far as Quadratic Equations.

It is very fully illustrated, and contains numerous examples and their answers. Some of them are very easy; others will require some thought before they are solved. For these alone we could recommend the book before us. It has, however, many points of excellence over such works as Twisden. The modern method of commencing with Dynamics and founding upon it the study of Statics, has been followed, and great stress has been laid on the subject of the units of space, mass, momentum, energy, etc. This is as it should be; and we cannot but feel that any pupil teacher or student preparing for London University Examinations, either Matriculation or Intermediate Science, will be fortunate if he is taken through this book. We also commend it to teachers of Theoretical Mechanics for South Kensington.

We should, however, have liked to see some of the improvements suggested by the Association for the Improvement of Geometrical Teaching adopted in this work. The *raison d'être* of new school books must be that they are up to date in their facts and methods. Especially should we like to see the word *acceleration* only used in its general sense, and *quickening*, or some such word, used in the limited sense of that part of the acceleration which produces change of speed only.

Even without this, however, the work in review stands among the first of its kind, and we commend it to any one seeking a book which will give them a trustworthy guide to the London Matriculation or Inter. Science Mechanics.

Elementary Inorganic Chemistry. By A. H. Sexton, F.R.S.E., etc., etc. London: Blackie and Son, Ld.

This little book has been extended from lectures given to the evening students at the Glasgow and West of Scotland Technical College to its present size. It is divided into five sections. (1) The book-work of the present elementary stage at Sonth Kensington, with a chapter on the Organic Substances required in the 'alternative' stage. (2) A series of simple experiments to illustrate this, with full instructions for private students. (3) A chapter on Chemical Calculations. (4) A series of questions. (5) An elementary course of Qualitative Analysis, to meet the latest requirements of the South Kensington Syllabus.

It contains 320 pages, and is well bound, clearly printed, and illustrated with forty cuts. These are in general unfamiliar, the drawings of ordinary apparatus being omitted, as the book is meant for students working in a well-equipped laboratory. To such we can recommend it. It contains more facts, and clearer explanations, than the majority of the elementary text-books of chemistry in vogue.

It is, of course, specially designed for the South Kensington course; but Matriculation students, and teachers preparing for the College of Preceptors', or the Fröbel Society's certificates, would find it to their advantage to consult it.

University Cor. Coll. Tutorial Series. Synopsis of Non-metallic Chemistry. By Wm. Briggs, B.A., F.C.S. London: Clive and Co.

The students of to-day are perhaps fortunate in finding such aids as the little work before us in their work. Speaking for ourselves, we took a copy of Frankland's Lecture Notes and made, with great labour, just such another book as this from it. It consists of a short introduction, a chapter of definitions and theory, and a set of short notes on the non-metallic elements, including all necessary for the elementary stage in inorganic chemistry, and for the London Matriculation. Three very useful appendices follow: one on the principles of the preparation of gases, with good working drawings; one on the separation of

the constituents of mechanical mixtures; and a third on chemical calculations; to which are added all the calculations set in chemistry at the London Matriculation since 1870, with their answers, a glossary, and the Matriculation regulations in chemistry. The book is clearly printed, contains 90 pp., and is interleaved.

We recommend every private student for Matriculation and elementary chemistry, and every teacher of chemistry to get one, and draw the apparatus, and make any further notes he may require on the blank pages.

Students of chemistry should observe that a controversy on the nature of flame has just arisen which will render the common statements in this and other text-books obsolete before next examination.

An Introduction to the Chemistry of Farming for Practical Farmers. By the Right Hon. Sir Thos. Dyke Acland, Bart. London: Simpkin, Marshall & Co., Limited.

We have seen of late years no work more likely to be of practical benefit to teachers than this. Written by a man of wide experience in farming, sympathising with farmers, living among them all his life, and, at the same time, acquainted with all the theories and experiments of scientific men, this book is intended as a finger-post both for teachers and learners.

In these days of technical classes it may be the lot of many to have to give lessons among a class of farmers who are disposed to think lightly of scientific agriculture. From this book such will learn the way to deal with their audience. The key-note of it may be found in the following extracts:—

'The writer is convinced that due weight must be given to experience if science is to improve practice.

'The accumulated experience of farmers is extensive; not always accurately recorded: the reasons are often far to seek. The chemist tries to explain the reasons, but he needs to verify the results of his principles by experiments in the open field.

'There is at present a general disposition among residents in the country to inquire into the facts and principles of agriculture. But we must begin with the facts, and work back to the principles.'

The work consists of an introduction and four parts. The introduction contains a list of some works found useful and recommended by the writer to students. The first part is on the produce of the farm, and answers the question, 'What are they made of?' Teachers of agriculture will do well to note how much chemistry is made use of here, and yet how little in the way of technical terms is employed. The second part deals with some organic chemistry and with some notes on the soil, in which the meaning of 'condition' is well explained. The third part deals with the action of manures (we recommend teachers and writers of books of agriculture who talk of nitrate of soda as a 'whip' to the soil to read it), and with food for grazing and dairy. The fourth part deals with practice and science.

The teacher of agriculture who desires to do something more than merely earn grants will wrong himself and his pupils if he does not read this book.

Object Lessons from Nature: A First Book of Science. By L. C. Miall. London: Cassell and Company, Limited.

Professor Miall is evidently a true teacher, as well as a man of science and a lover of nature. We have already had the pleasure of commending this work on its first appearance. We take the opportunity of its re-issue in cheaper form to confirm our former favourable opinion. Its twenty-six ably-written chapters, with their wealth of illustration, will provide the thoughtful teacher with materials and suggestions for scores of lessons. The subjects treated include animals, plants, and physical phenomena, and they are treated in a manner at once simple and scientific.

BRITISH MUSEUM 28 JY 92

PRIZE ANECDOTE.

The following has been adjudged the best anecdote sent in. A cheque for half-a-guinea has therefore been forwarded to the sender, Mr. J. Cock, Parochial Schools, Liskeard, Cornwall:—

Examiner.—What is the visible sign in baptism?

Girl.—The baby, sir.

Examiner.—When were the names of Abram and Sarai changed?

Girl.—When they were married.

We again offer a prize of half-a-guinea for the most *amusing* Anecdote connected with school life.

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(3) That the judge reserves to himself the right to divide the prize between two or more competitors, and to print any anecdote submitted.

(4) That letters from parents, examination answers—indeed anything amusing connected with school life, is admissible.

(5) That all anecdotes should reach the office not later than the 15th of August, and be addressed—

The Editor of
'THE PRACTICAL TEACHER,'
5, Pilgrim Street, Ludgate Hill,
London, E.C.

Anecdote.

A Home on the Yorkshire Hills.—Rare are the occasions on which in these pages we have recommended health resorts. As, however, many of our friends may just now be hesitating where to go, we feel we shall be doing them good service by bringing under their notice a famous northern sanatorium, 'Craiglands,' Ilkley. Dispirited, depressed, worried, and altogether out of joint with the world through repeated attacks of that malarial fiend influenza, we came here with but scant hope of recovery. The presiding genius of 'Craiglands' is Dr. Dobson, a 'good physician' indeed, whose unremitting care, wide experience, and exceptional skill in the administration of hydropathy, are proverbial. Under his kindly guidance and care we speedily began to improve, and to feel the old love of life return with added zest. We can therefore unreservedly recommend this home on the Yorkshire hills to those of our readers in quest of health. To these we say, come to 'Craiglands,' consult the doctor, whose fee, by the way, is moderate in the extreme, and whose baths are as effective as any in the kingdom. Then, when you get the 'turn,' climb the everlasting hills which rise in rugged grandeur behind the establishment. Here you can drink deep draughts of the first physician's elixir of life—pure air. But it is not for the invalid alone that 'Craiglands' hath charms; barely one in six take the 'treatment.' The strong and healthy can gratify almost every desire. Are you fond of fishing? You can whip the Wharfe for trout for a mere acknowledgment. Do you row? On the same river you can hire an outrigger. Has golf 'got' you? The Ilkley links are hard by. Do you play tennis or croquet? You can in our own private grounds play 'set' after 'set' to your heart's content. And as for walking, riding, driving, or cycling, few spots in England can vie with this for variety and exquisite loveliness of scenery. 'Craiglands' is pre-eminently a pleasure resort. The house rings with the merry laugh of joyous youth bent on enjoyment. No night passes without a dance, and occasionally comediettas, operas, and plays are presented in a manner that would not discredit professionals. A well-merited word of praise is due to Mr. Jabez Dobson, the thoughtful and indefatigable manager who, with his obliging wife, give their personal attention to the domestic arrangements of the establishment. Everything is spotlessly clean; the food is not only abundant as to quantity, but excellent as to quality, and to add to the charm of meals, you are served by smiling Yorkshire damsels, whose only anxiety is to please you. We close these remarks by prophesying that when you have been here, you will do as we have—come again.

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